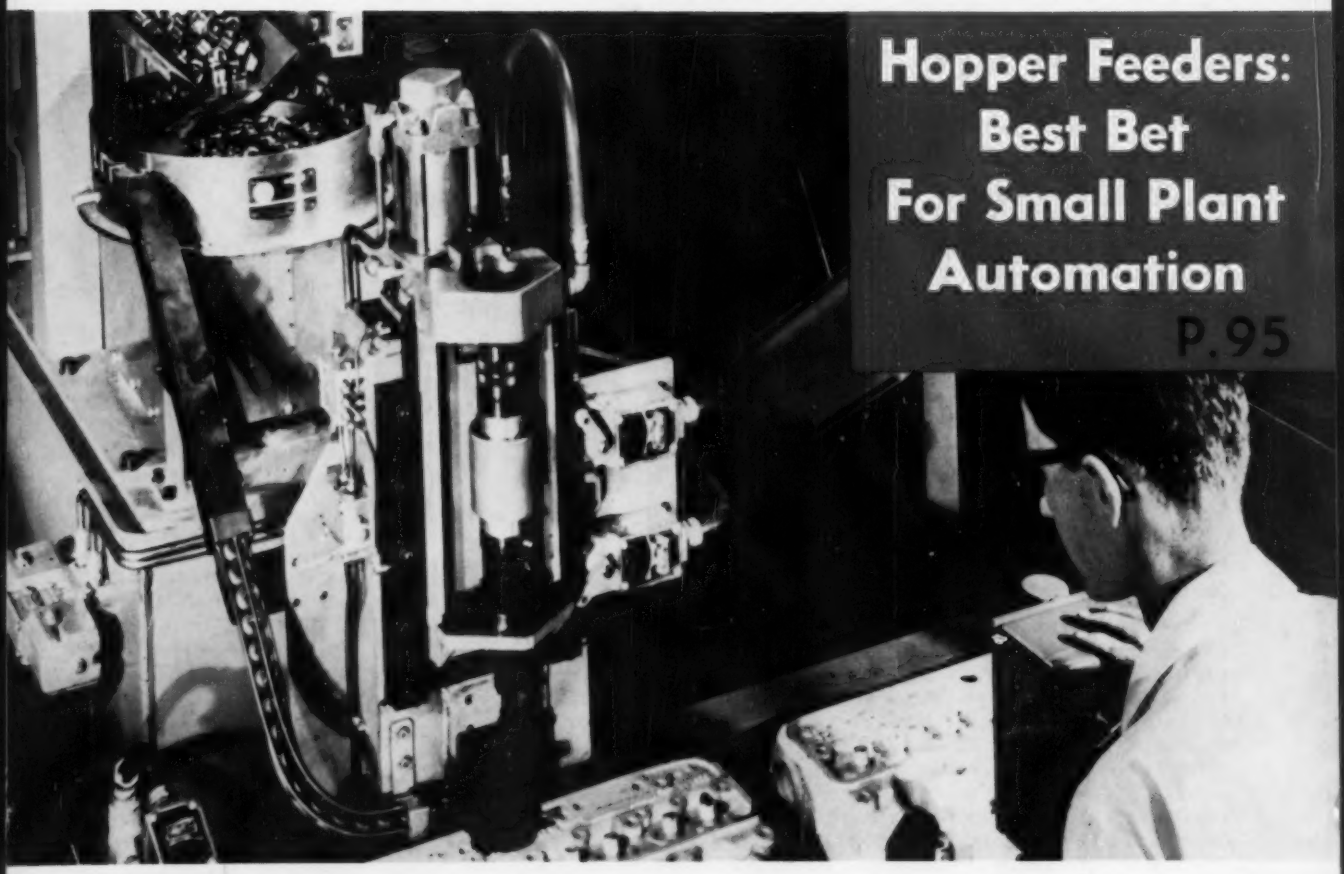
August 23, 1956

The IRON AGE

The National Metalworking Weekly



Hopper Feeders: Best Bet For Small Plant Automation

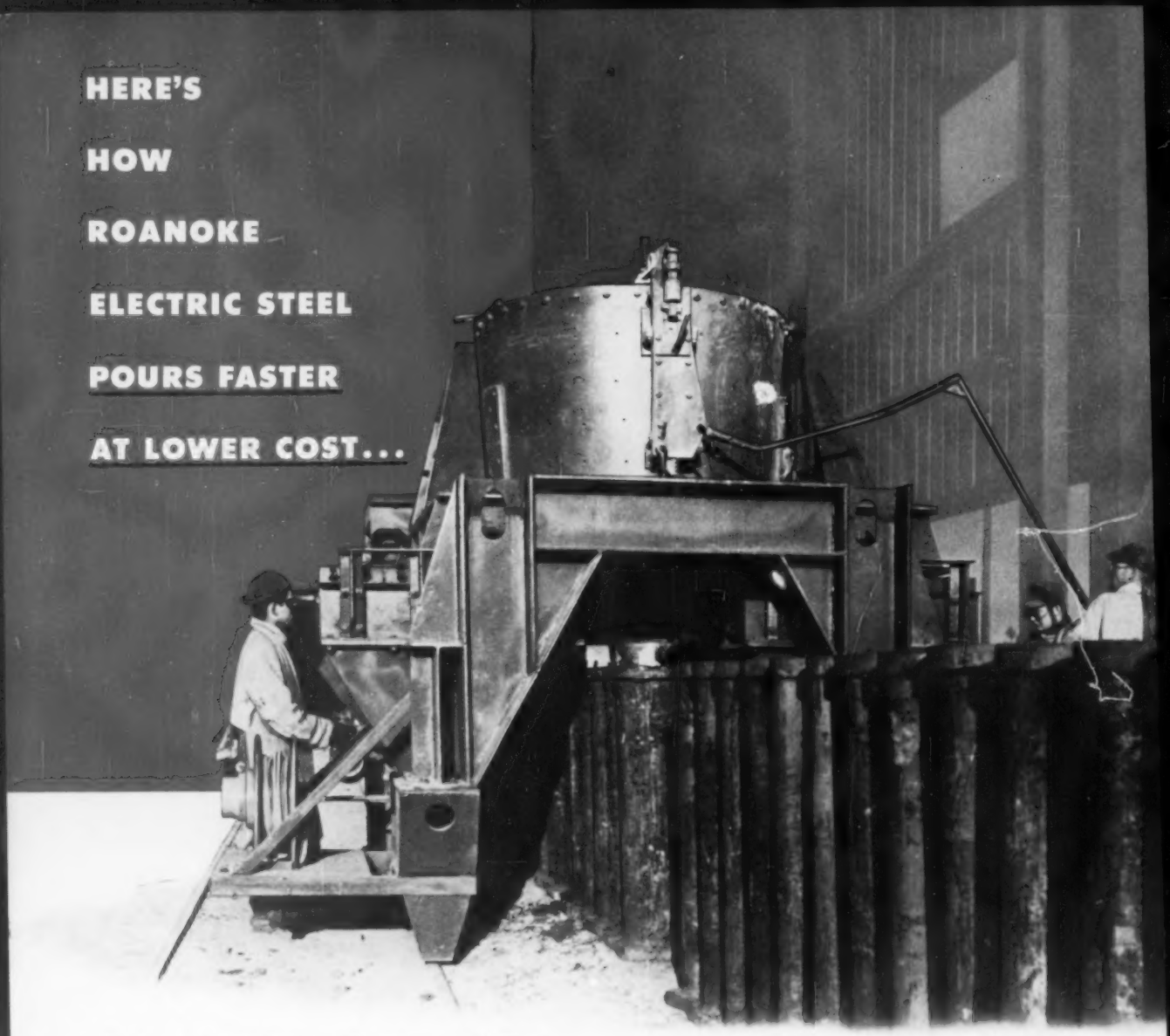
P.95

Why Steel Scrap Prices Hit New High P.55

Controls: Automation Spurs Market Growth P.61

Digest of the Week P–2

HERE'S HOW ROANOKE ELECTRIC STEEL POURS FASTER AT LOWER COST...



Faster pouring of ingot molds at lower cost! That's what a Whiting special ladle transfer car is doing at the Roanoke Electric Steel Corporation plant at Roanoke, Virginia.

Two rows of ingot molds are set up on the floor. The transfer car on tracks with the large Whiting ladle is electrically operated to pass back and forth over the molds. The ladle is mounted in standards with filler blocks to position it at two elevations and thus accommodate two mold heights. The standards are mounted on roller conveyors with a manually operated racking device for lateral positioning to either of the two rows of molds. One operator directs the pouring spout and another man on the opposite side of the car controls the flow of the metal affording a coordinated operation that is fast and efficient. Not only does this installation speed pouring, but it reduces pouring costs as well.

In addition to special ladles such as the Roanoke ladle transfer car, Whiting Corporation manufactures a large variety of standard ladles completely illustrated in the Whiting Ladle Catalog.

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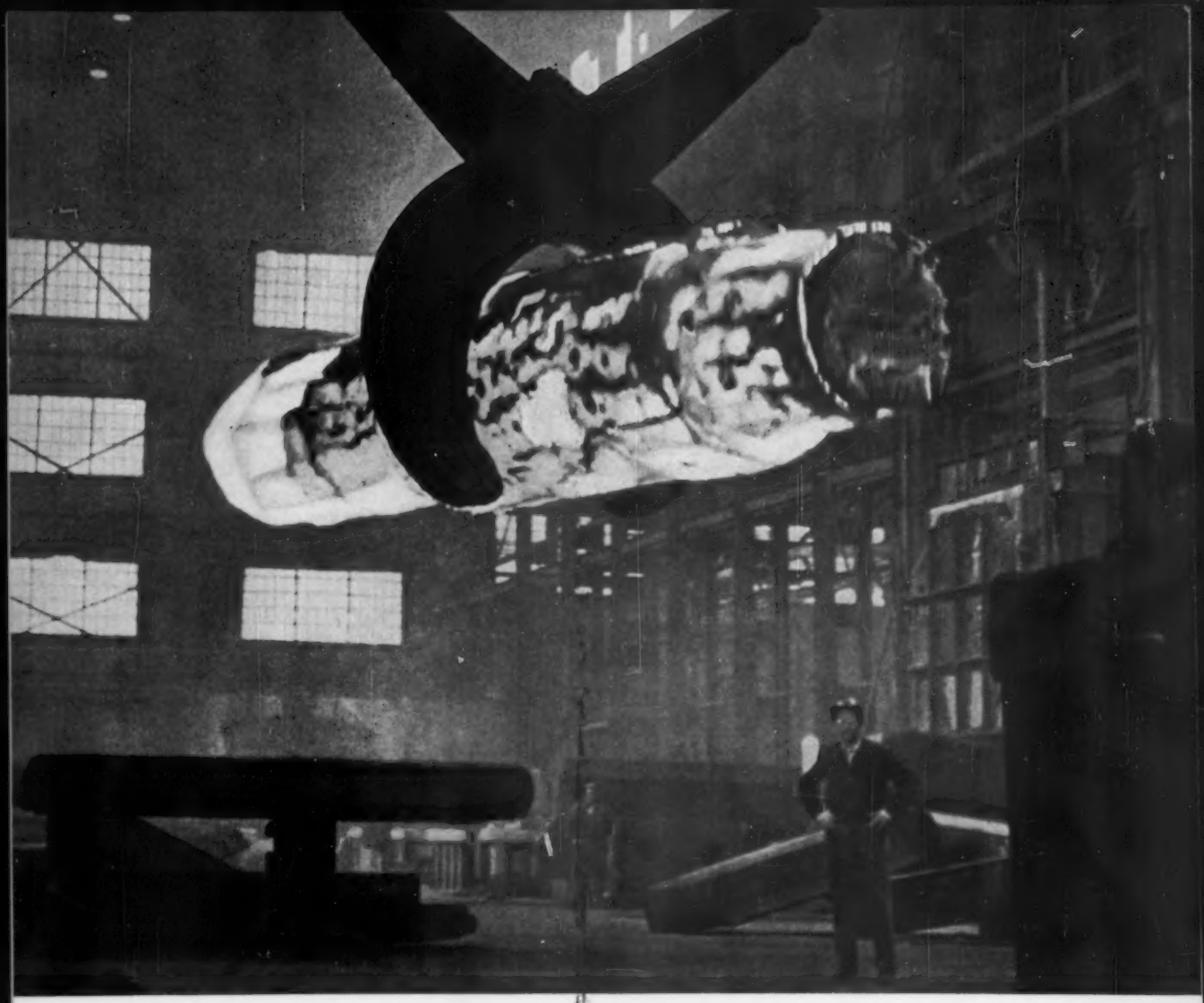
This advertisement appeared in STEEL, FOUNDRY and AMERICAN FOUNDRYMAN



Another Big One on the Way

This glowing mass of steel winging through the air is a large forged roll in the making. As you see it here, it has been blocked and reheated, and is now en route to the second forging operation. When the Bethlehem shops have finished with it, the roll will have a maximum diameter of 36 in. and a length of 10 ft. It will weigh 21 tons after finish-machining and grinding. The customer plans to use it for hot-rolling aluminum.

Rolls like this require the most painstaking care in every detail of manufacture. At Bethlehem they get it. Steel-making, forging, heat-treating and machining are all in expert hands, and the strictest metallurgical controls are enforced throughout. When a Bethlehem roll emerges from the shops, it meets all specifications on size, finish, hardness. It's ready for action.

Whatever your needs in rolls, we can meet them to your entire satisfaction. Call us if your operations involve cold-rolling ferrous sheets and strip . . . running-down and finishing steps on copper and brass sheets . . . hot- and cold-rolling aluminum sheets . . . cold-rolling aluminum foil.

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BETHLEHEM STEEL

DIGEST OF THE WEEK IN METALWORKING

Aug. 23, 1956—Vol. 178, No. 8

The IRON AGE

Digest of the Week in Metalworking

Starred items are digested at right.

EDITORIAL
Who Pays the Higher Wage Costs? 7

NEWS OF INDUSTRY
*Special Report: Why Scrap Prices Hit Ceiling .. 55
*Power: Diesel Engines Are Staging Comeback .. 57
*Construction: Concrete Challenges Structural .. 58
*Construction: Ebonized Steel Gains Favor 59
*Production: Mills Will Refine Coke Oven Oils .. 60
*Marketing: Controls Approach Sales Jackpot .. 61
*Marketing: Farmers Like Aluminum Pipe 62
Personnel: Iron Age Salutes 83
Iron Age Introduces 85
Metalworking Briefs 164

NEWS ANALYSIS
Newsfront 53
Report to Management 69
*Automotive Assembly Line 72
*This Week in Washington 77
*West Coast Report 79
Machine Tool High Spots 81

TECHNICAL ARTICLES
*Hopper Feeds for Small-Plant Automation 95
Reclaimed Diamonds Help Pay Grinding Costs . 99
*Treated Silica Brick Eliminates Dust 100
*Better Packaging Stems From Simple Ideas 102
*Russians Hot Roll Gears on Production Mill 104
*How Fracture Type, Specimen Size Affect Impact 107
Technical Briefs 120

MARKETS & PRICES
*The Iron Age Summary—Steel Outlook 137
Steel Products Markets 138
Comparison of Prices 139
Iron and Steel Scrap Markets 140
Nonferrous Markets 144
Steel Prices 147

REGULAR DEPARTMENTS
Dates to Remember 13
Free Literature 112
New Equipment 128

INDEX TO ADVERTISERS 164

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NEWS DEVELOPMENTS

WHY SCRAP PRICES HIT THE CEILING P. 55

Scrap prices are now at a new high. Low inventories, high production, export and other factors combine to push prices to new levels. End of steel strike found mills with low supplies and prices climbed under pressure. Possible ore shortage also contributes to higher prices.

DIESELS FOR STATIONARY POWER COME BACK P. 57

After years of downturn, sales of diesel engines for power are on the upgrade. Adaptability to several fuels is a big factor. You can pick your engine for cheapest fuel.

CONCRETE CHALLENGES STRUCTURAL STEEL P. 58

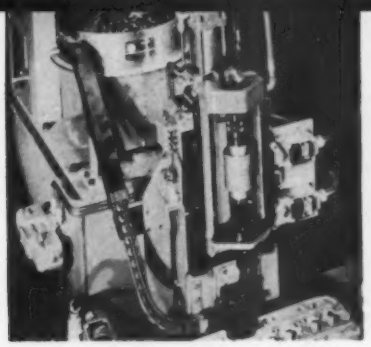
Development of pre-stressed concrete structural members in last six years is making this material more attractive to builders in light of current steel shortage. Prices are competitive, but there are increasing instances of concrete underbidding.

BLACKENED STAINLESS SHEET IN COMEBACK P. 59

Ebonized steel, new name for black stainless, is being recalled to service by Armco Steel Co. Developed in World War II for military use, it will make its first appearance on new Madison Ave. building.

MILLS PLAN PLANTS TO REFINE COKE OVEN OILS P. 60

Both J&L and U. S. Steel announce million dollar plants to refine light oils from coke ovens. It's a rapidly growing market with purified benzene, toluene and xylene in demand.



AUTOMATIC ASSEMBLY machine now under development at GM Technical Center calls for number of hopper feed stations like this. Of 75 parts needed in Oldsmobile cylinder-head assembly, all but three will be loaded by machine. Hopper feed story summarized below begins on P. 95.

AUTOMAKERS JOCKEY FOR 1957 SALES RACE P. 72

Chevrolet and Ford toe the line as model changeovers are completed and production of 1957 cars gets under way. Productive ability will be a big factor. Plymouth, edged out of third place this year by Buick, is out for revenge. Olds coming from behind.

FEATURE ARTICLES

HOPPER FEEDS: BEST BET FOR SMALL-PLANT AUTOMATION P. 95

Simple, yet ingenious, hopper feeders are described by one plant man as the poor man's best bet in the hectic race toward automatic manufacturing. To others, they can make the difference between staying in business or closing the doors for good. They've already established remarkable production records, upping output on some machines 400 pct.

TREATED SILICA BRICK ELIMINATES DUST P. 100

Silicosis continues a potential hazard to workers' health in some industries. Casters, steelmakers and refractory producers watch for every sign of airborne silica whether dusted from sand or brick. One steelmaker found a simple, inexpensive solution in using treated brick. This prevents dusting, and along with other controls, gives the firm an admirably low incidence of silicosis.

BETTER PACKAGING STEMS FROM SIMPLE IDEAS P. 102

Packaging products costs money. Whether you dismiss it as a necessary evil or cultivate it as a fertile area for cost-cutting, it figures into costs. Don't ignore its possibilities. Here are some simple yet important swipes North American Aviation has made.

RUSSIANS HOT ROLL GEARS ON PRODUCTION MILL P. 104

Gears of many types are rolled hot on a production mill in Moscow's Red Metal Worker plant. Finished product is reportedly made stronger, faster, and at less cost than by conventional milling methods. Spur gears are produced by hot rolling teeth in long billets, then slicing off like sausages.

HOW FRACTURE TYPE, SPECIMEN SIZE AFFECT IMPACT P. 107

Fracture type provides significant clues to steel impact properties. In martensitic structures, both ductile and brittle fractures can frequently be traced to tempering temperature. Effect of specimen size is generally more pronounced at higher hardnesses. It's an important factor in correctly evaluating impact properties.

MARKETS AND PRICES

CONTROLS REACH $1 BILLION JACKPOT P. 61

It looks like the electrical control industry will register over $1 billion in sales in 1956. This marks its second entrance into the select circle. Impressive gains have been registered in fields of industrial automation. Sales may better '54 figure by 25 pct.

FARMERS TAKE TO ALUMINUM PIPE P. 62

Since Alcoa pioneered this market in 1946, sales of aluminum pipe to farmers have multiplied 60 times. They find it adaptable for on-the-surface irrigation systems. Its light weight makes it easy to assemble and move. Biggest markets are in the West and the Southern regions.

MORE MARKETING STATISTICS ARE PLANNED P. 77

Government will make available to marketing specialists more and better statistical reports next year. A total of $35 million has been earmarked for studies. Wage and price data will be included.

WHAT'S METALWORKING'S FUTURE IN SEATTLE P. 79

Area is now booming, but most business is in military aircraft orders. Chances for development and diversification rest on cheap power. Hydroelectric potential is 40 pct of the nation's total. Newcomer is gas.

PITFALLS LIE AHEAD FOR STEEL CONSUMERS P. 137

Tough sledding lies ahead for the nation's steel consumers. The strike set steel order books back a month or more. Mills will have to cut back on delivery promises to make up the difference. Maintenance problems.

NEXT WEEK:

SURVEY REPORT: HOW TO HIT YOUR MARKET

The new U. S. Census of Manufactures offers metalworking companies an excellent tool for determining market potentials, sales forecasts, industry trends and a host of other marketing aids. This 8-page report will tell you how to apply it to your marketing program.

ULTRASONIC QUENCHING: IT'S NEW, MORE EFFECTIVE

Definitely different, remarkably efficient—ultrasonic quenching actually provides hardnesses that are higher. No amount of quench oil agitation can produce the same quenching effectiveness. Here's how vibratory waves sent through the quenching medium turn the trick.

A NEW METALLURGICAL TOOL FOR THE PRODUCTION OF HIGH QUALITY CAST IRON

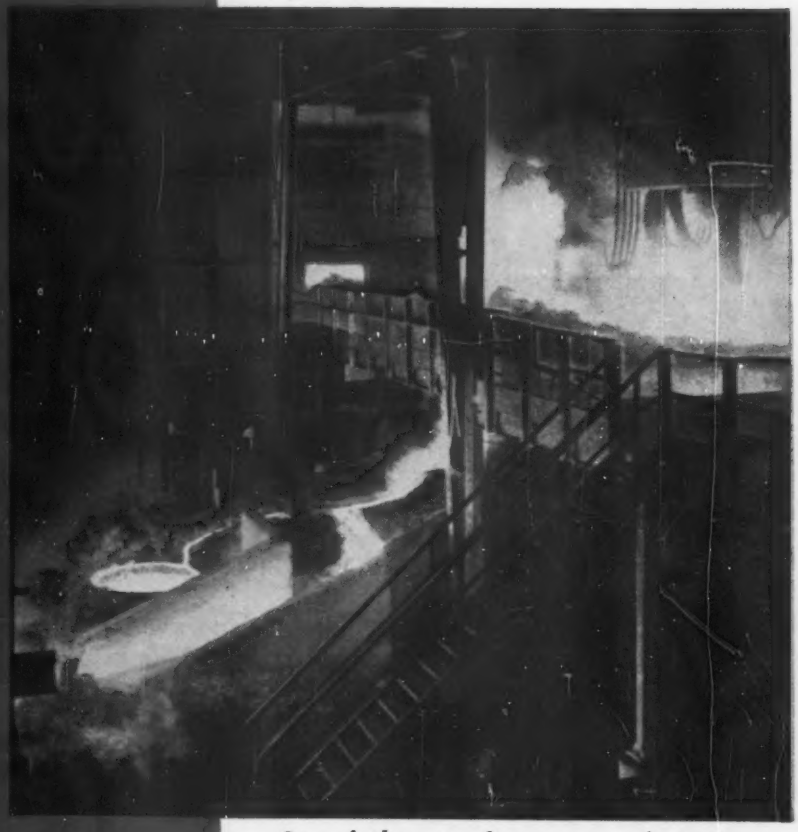
We offer to the American industry the AJAX-JUNKER 60 cycle induction furnace for the melting and superheating of cast iron, and particularly for the production of ductile cast iron. The AJAX-JUNKER furnace is economical in foundries with intermittent operation and frequent alloy changes. It melts loose turnings with high recovery, and can easily operate at the high temperatures required for desulphurizing. Controlled stirring of the molten metal speeds up recarburizing rate and solution of alloy ingredients. The photograph shows a Junker coreless induction furnace for melting and superheating cast iron in a German foundry.

For further information write to

AJAX AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

We've doubled our capacity for SILICO-MANGANESE



One of the new silicomanganese furnaces at our Philo, Ohio plant.

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DOWNSTAIRS

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Indexed in the Industrial Arts Index and the Engineering Index.

ABP NBP

EDITORIAL

Who Pays the Higher Wage Costs?

◆ ANOTHER ROUND of wage and price increases has hit us. This is the 11th. Don't think that this one will be the last. It won't. Labor is in the saddle. It has the power and is going to use it.

Labor costs have been going up much faster than productivity. The experts say you just can't keep this up. But we have kept it up; and it looks as though we are going to keep it up for some time.

To support this merry-go-round there has to be a way out, else things will go to pieces in a big way. Neither labor nor management can afford a depression as the means of "learning a lesson." That is not the way out; if there is one.

The fashionable thing for business writers to say today is that the customer pays for the wage and price increases. So he does. But that's not the whole story. Where does the customer get the money with which to pay the freight? That's important, too.

Labor says it wants its share. It certainly is getting it. It also says that without purchasing power the booms will bust. So they would, but inflation also busts booms.

Management says it must have a return to pay for expansion and replacement. So it does, but it can't always get it from higher and higher prices. Most executives know this; or should.

Stockholders say they should have more dividends. They should, but they can't get them unless business is good and costs are controlled. Too high wage costs frighten risk capital.

The public gets its products and services from research, management, labor, capital—and engineering skill. It must be this way else business would long ago have priced itself out of the market. Now the job becomes more difficult as costs gallop onward—and upward.

Old equipment has to be replaced quickly if wage costs are to be reduced—or held in check. Lack of skilled labor must be offset by machinery. New product and methods engineering must be stepped up sharply.

Labor must check its power complex. Management must be willing to take even bigger risks—with more confidence in the future and in its own ability.

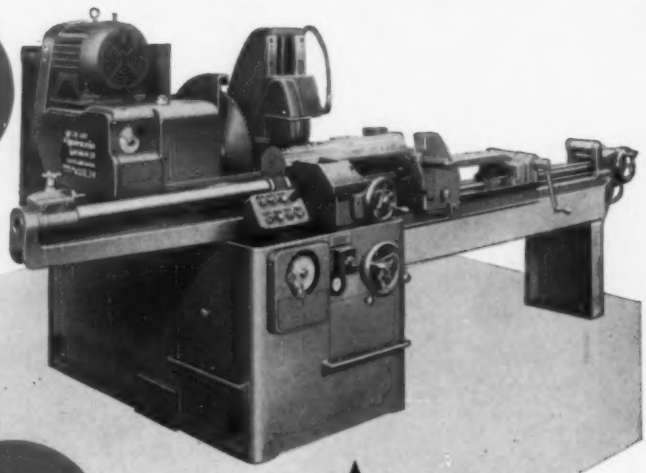
The alternative is horrible even to think about!

Tom Campbell

EDITOR-IN-CHIEF

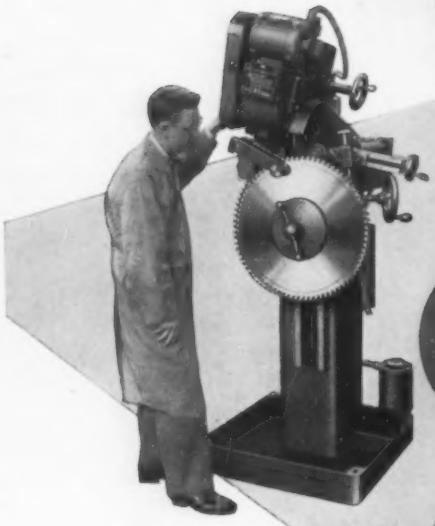
THE Triple-Chip METHOD IS A *Triple-threat* TO HIGH CUTTING COSTS

CIRCULAR SAWING MACHINES



The No. 2-8 machine for cutting off solid metal up to 8" square.

SAW BLADE SHARPENERS



The G-45 sharpener for blades 8" through 48" diameter.

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dear editor: *letters from readers*

Good Intentions

Sir:

As an industrial librarian, I hesitate to criticize Mr. M. O. Baker's August 2 article, "Metallurgical Library Pays Its Own Way," since his intentions are unquestionably laudable. However, I do feel that comments are in order.

Mr. Baker's question, "Why have a professional librarian?" does not require a lengthy answer. It is as easily answered as "Why have a professional metallurgist?" In both cases the jobs require certain skills which any clerk, no matter how competent, does not possess. It's as simple as that.

Certainly in the industrial library field we librarians are far removed from the traditional cartoon-type librarian whose major qualification was that she "loved books." *S. Sass, Librarian, The William Stanley Library, General Electric Co., Pittsfield, Mass.*

New Man

Sir:

Being a pretty new man in the purchasing field as a buyer, I just recently realized the importance of THE IRON AGE. I just finished reading your article, "How to Get More Out of Your Metalworking Dollar—Plating," in the June 28 issue. It certainly is of great value to me.

I would appreciate it very much if you can furnish me with a copy of the previous articles of this *series. G. A. Zanoni, Glen Ellyn, Ill.*

Ultrasonic Suggestion

Sir:

We would appreciate any information you could provide, or references you could suggest, on the use of ultrasonics in grain size reduction. Our interest lies in its application to welding wherein we have encountered tremendous grain size and growth in the weld and heat affected zone. The application of ultrasonic energy, either during welding or during post heat, suggests itself as a means of reducing this grain size. *S. Goodman, Stamping Process Dept., Ford Motor Co., Dearborn, Mich.*

The welding application mentioned appears to have considerable validity. For further information, we suggest you contact Prof. H. V. Fairbanks directly at West Virginia University, College of Engineering, Morgantown, W. Va.—Ed.

Good Job

Sir:

We would like very much to obtain six copies of the article in the August 2 issue of THE IRON AGE, subject — "Drawn Parts: Save Through Simplified Design."

This is a wonderful article; well written, and contains much valuable information. *K. W. Massey, Development Engineer, Superior Steel Corp., Carnegie, Pa.*

"Smith, on behalf of the Safety Council . . ."

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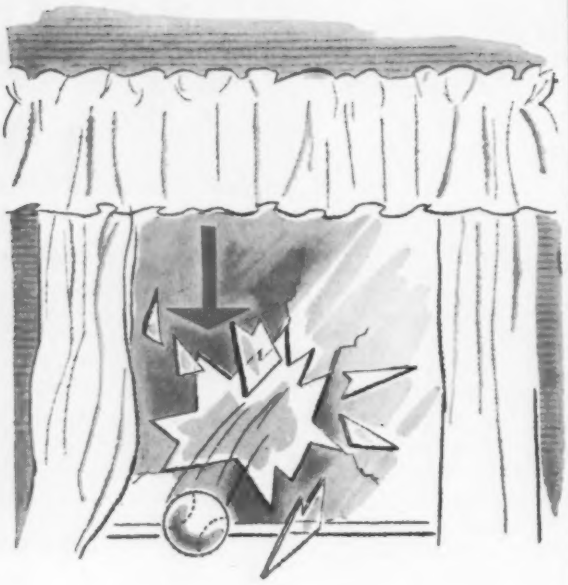
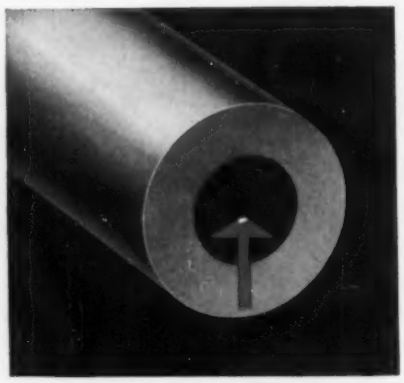
Digest of the Week in Metalworking

HELP YOU FIND YOUR FAVORITE FEATURES

The IRON AGE



a hole here means work...



a hole here saves work

Crucible Hollow Tool Steel Bars take much of the work out of making ring-shaped steel parts, or tools with a center hole. The hole's already there. You save expensive drilling, boring, cutting-off and rough-facing operations . . . you reduce machine time and scrap losses.

You can now get Crucible Hollow Tool Steel Bars in any of the famous Crucible tool steel grades, in virtually any I.D. and O.D. combination. And you can get *immediate delivery* from stock of the five most useful grades — KETOS oil-hardening . . . SANDERSON water-hardening . . . AIRDI 150 high-carbon, high-chromium . . . AIRKOOL air-hardening . . . NU DIE V hot-work tool steels.

Your Crucible representative can quickly show you how Crucible Hollow Tool Steel Bars will save you work and money. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

fatigue cracks

by William M. Coffey

The Lamented Hassle

The late lamented hassle between steel producers and steel labor sent some of the nation's top journalistic brains scurrying to New York and Pittsburgh to cover one of the year's biggest domestic stories.

Editor-in-Chief Tom Campbell is quick to recognize tough competition, and just as quick to devise sneaky ways to outwit them. The aforementioned t. j. b.'s, old hands at ferreting out beats and scoops, devised as many sneaky ways to keep reporter Campbell from stealing the story out from under their very sharp eyes.

It was good clean fun while it

Reporters Campbell (l.) and Kilgallen

lasted—and on a nice friendly basis. Everybody had been through the mill many times before and after a while the old-timers learn that while you are paid to stab a competitor in the back journalistically (beat his brains out with a typewriter, so to speak) personal relationships don't enter into it. Live and let live, sort of.

That's why such strange things (to the unitiated) as the accompanying picture of Reporter Campbell and Jimmy Kilgallen of International News Service happen. Mr. Kilgallen (James L., to millions of newspaper readers) has been a top reporter for years. He also spawned an equally well known reporter in the person of Dorothy Kilgallen. Messrs. Kilgallen and Campbell got along fine personally, as the picture shows ("Hi, Tom, you old goat"; "hi, Jimmy, you old horse trader"). But journalistically, it was something else.

We wouldn't want to spoil an old friendship, or start a free-swinging pillow fight, so we won't voice an opinion on who won the journalistic battle.

Suffice it to say that THE IRON AGE came through the steel rhubarb in a blaze of glory, as everyone knows—and expected. We predicted the first-year wage and fringe cost to producers within three-tenths of a cent, and the length of the contract (three years). Also, we were weeks ahead of the pack in reporting the approximate amount of the subsequent steel price increase.

New Puzzler

Three businessmen from out of town had to stay overnight, so they went to a hotel and got a room. The manager charged them $30.00 or $10.00 each. After a few minutes, he said to the room clerk, I've charged them too much, so give them $5.00 back. While on his way to the room, the room clerk decided to keep $2.00 and only give them $3.00 back. This means that the businessmen only paid $27.00 and the room clerk kept $2.00; but what happened to the other dollar? Thanks to Phyllis J. Russo, Henry Owens & Co., Inc., Cranston, R. I.

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a tough, resilient, corrosion resistant alloy . . . is a vital part of our daily living . . .

ELECTRIC MOTORS

. . . run better and longer with bearings and wearing parts made of Elephant Brand Phosphor Bronze.

SWITCHES

. . . owe much of their life and usefulness to fatigue resisting parts of Elephant Brand Phosphor Bronze.

SPRINGS

. . . hold their temper and bounce longer and better if they are made of Elephant Brand Phosphor Bronze.

MARINE EQUIPMENT

. . . resists water and weather with engine parts and hardware made of Elephant Brand Phosphor Bronze.

ELECTRONIC EQUIPMENT

. . . functions accurately and efficiently with components of Elephant Brand Phosphor Bronze.

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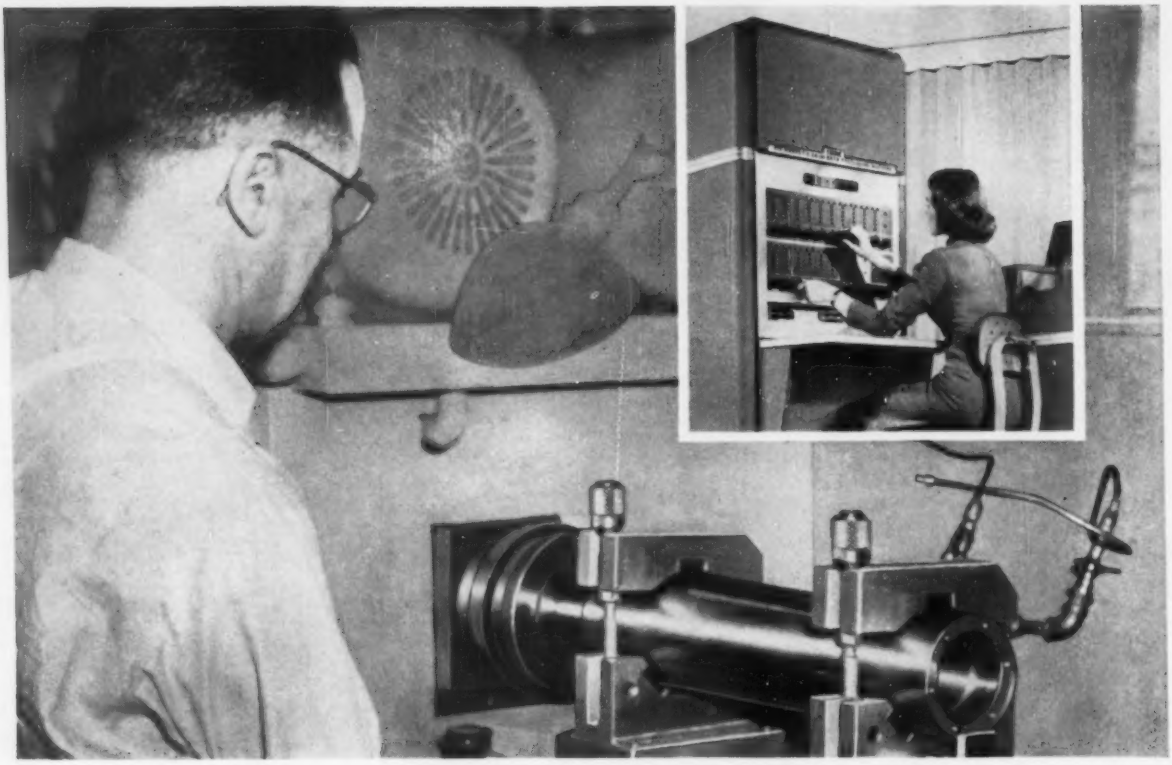

ELECTRONIC COMPUTER

Gets An Assist From B&W Mechanical Tubing

A remarkable "think" machine—called the Type 650 IBM Magnetic Drum Data Processing Machine—is designed to serve the large areas of computation not now covered by the huge "brains" or the smaller electronic calculators. A product of International Business Machines Corp., this commercial and engineering computor can "think", "remember" and store information, and is capable of simultaneous computation and calculation.

As its name implies, a vital part of this unique machine is the rotor shell of the Magnetic Drum which provides the information storage space on the drum. To produce this shell with its required magnetic property, high quality B&W Mechanical Tubing is cut to size, turned, ground, copper-plated, then coated with a nickel-cobalt special magnetic-field plating and finally dynamically balanced.

In a precision machine such as this, the selection of B&W Mechanical Tubing depended upon its ability to meet not only specific fabrication requirements but also a number of unusual service conditions. For example, the drum rotor turns at high speed and must retain its stability. In addition, temperatures and vibrations can also directly affect its function in the machine.

The highly satisfactory performance of B&W Mechanical Tubing in this uncommon application is typical of its performance in *all* types of products and services with *all* kinds of requirements. Write for Bulletin 361 for the comprehensive story of how B&W Mechanical Tubing serves Industry. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA-6005 (M)

Seamless and welded tubular products, seamless welding fittings and flanges—in carbon, alloy and stainless steels

dates to remember

SEPTEMBER

Metal Powder Assn. — Fall meeting, Sept. 7-9, Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., N. Y.

American Institute of Chemical Engineers—Fall meeting, Sept. 9-12, William Penn Hotel, Pittsburgh. Society headquarters, 120 E. 41st, N. Y.

The American Society of Mechanical Engineers,—Fall meeting, Sept. 10-12, Cosmopolitan Hotel, Denver, Colo. Society headquarters, 29 W. 39th St., N. Y.

EXPOSITIONS

The Packaging Machinery Manufacturers' Institute, Sept. 11-14, Cleveland.

Assn. of Iron & Steel Engineers, Sept. 25-28, Cleveland.

Metal Show—Oct. 8-12, Cleveland.

Society of Automotive Engineers—National tractor meeting and production forum, Sept. 10-13, Hotel Schroeder, Milwaukee. Society headquarters, 29 W. 39th St., N. Y.

American Die Casting Institute — Annual meeting, Sept. 11-13, Edgewater Beach Hotel, Chicago. Society headquarters, 366 Madison Ave., N. Y.

Porcelain Enamel Institute — Annual meeting, Sept. 12-14, Broadmoor Hotel, Colorado Springs, Colo. Society headquarters, 1145 19th St., N. W. Washington 6, D. C.

American Society for Testing Materials—Second Pacific area national meeting and apparatus exhibit, Sept. 16-21, Hotel Statler, Los Angeles. Society headquarters, 1916 Race St., Philadelphia.

Instrument Society of America—Eleventh annual international instrument-automation conference and exhibit, Sept. 17-21, New York Coliseum, N. Y. Society headquarters, 1319 Allegheny Ave., Pittsburgh.

American Hot Dip Galvanizers Assn.—Semi-annual meeting, Sept. 20-21, Greenbrier Hotel, White Sulphur Springs, W. Va. Assn. headquarters, 1806 National Bank Bldg., Pittsburgh.

Steel Founders' Society of America—Fall meeting, Sept. 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 606 Terminal Tower, Cleveland.

The Material Handling Institute—Fall meeting, Sept. 24-26, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 813 Clark Bldg., Pittsburgh.

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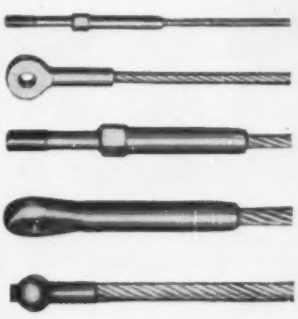

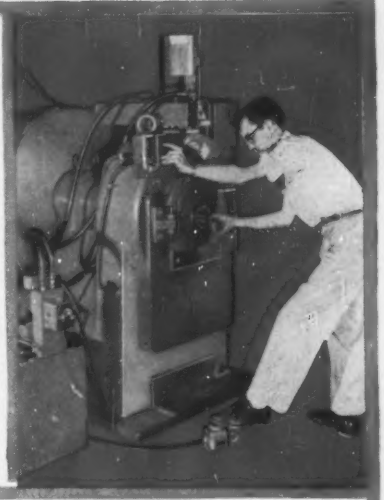

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This special modification of rotary swaging permits varied steel fittings to be fastened to the ends of control cable quickly and **permanently** by flowing the metal of the fitting around the cable strands. The Fenn Model 2H Hydroformer, in use at Sikorsky Aircraft, Stratford, Connecticut, produces cable assemblies for both the main and tail rotors, engine and brake controls, and reduces tubing for push-rod controls for helicopter flight systems.

Die closing is controlled automatically in the hydroformer by a pair of hydraulically actuated wedges. These same wedges allow the dies to open during operation to permit the insertion or withdrawal of fittings of various sizes and shapes. A whole new field of application has been opened by the hydroforming process and undoubtedly includes the answer to your assembling problem. Write for Catalog SM56 for full information.

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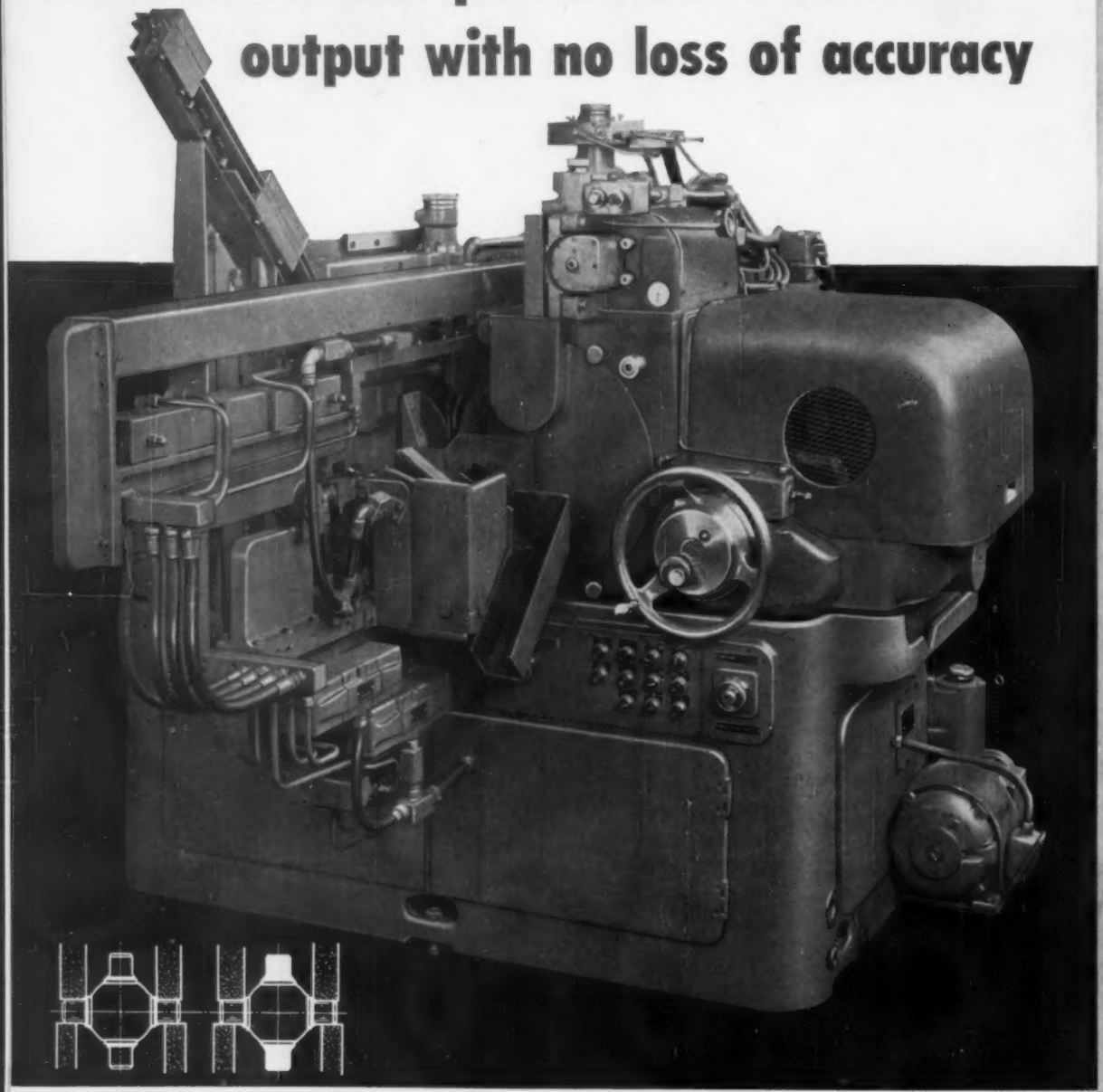

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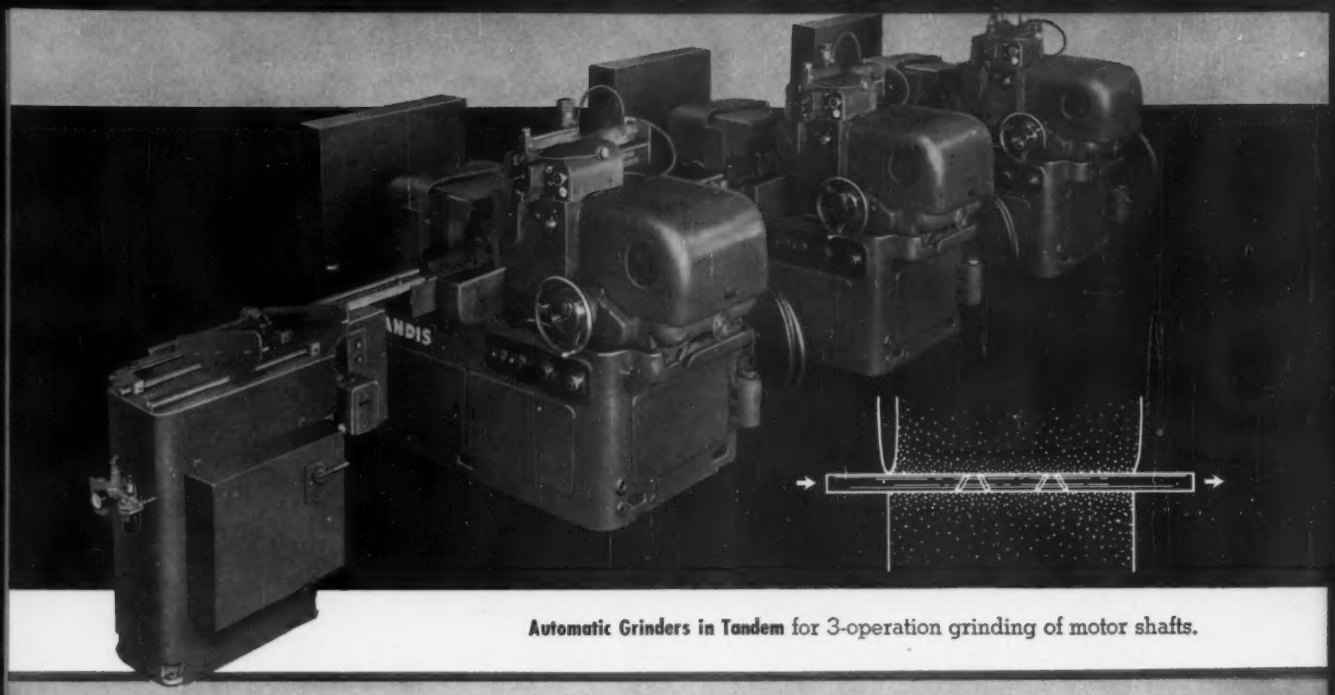

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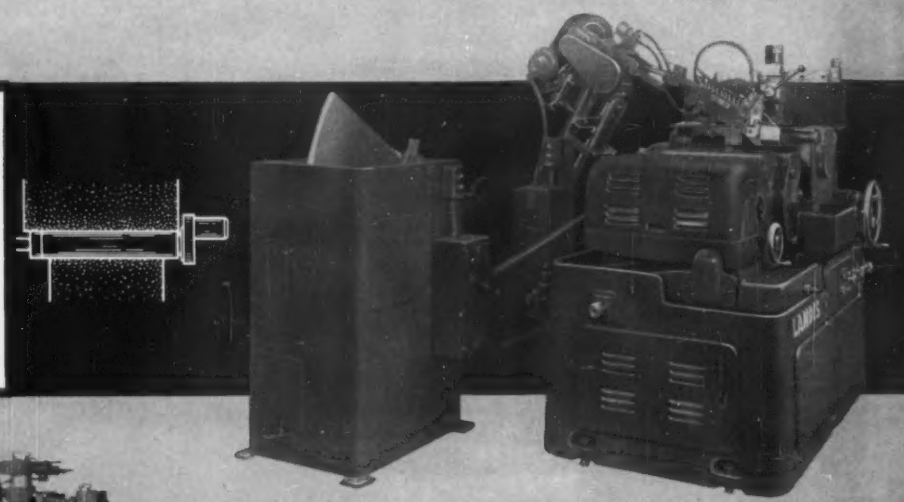
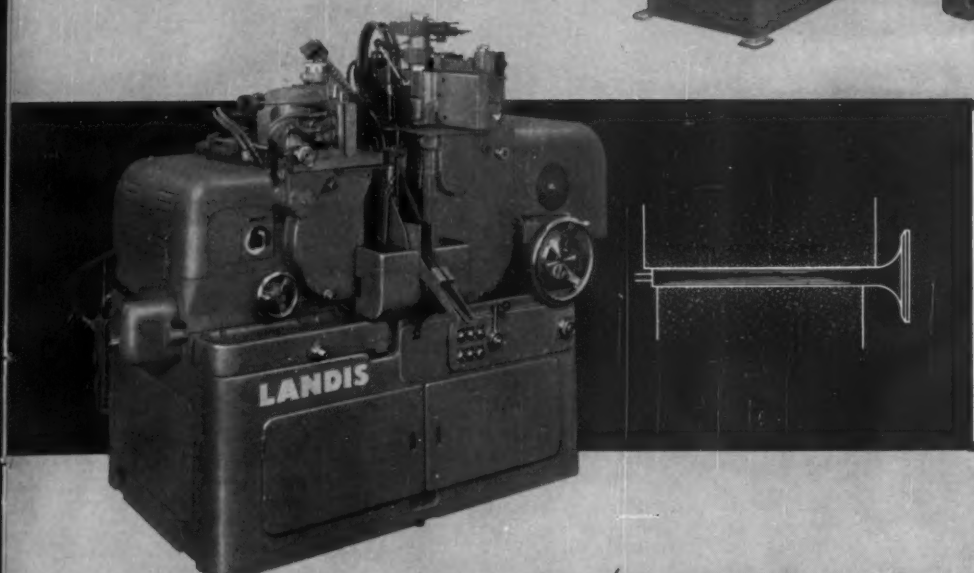
Automatic Grinding of Small Crankshaft. Production is 375 pieces per hour.





Automatic Finish Grinding of 1320 automotive valves per hour.

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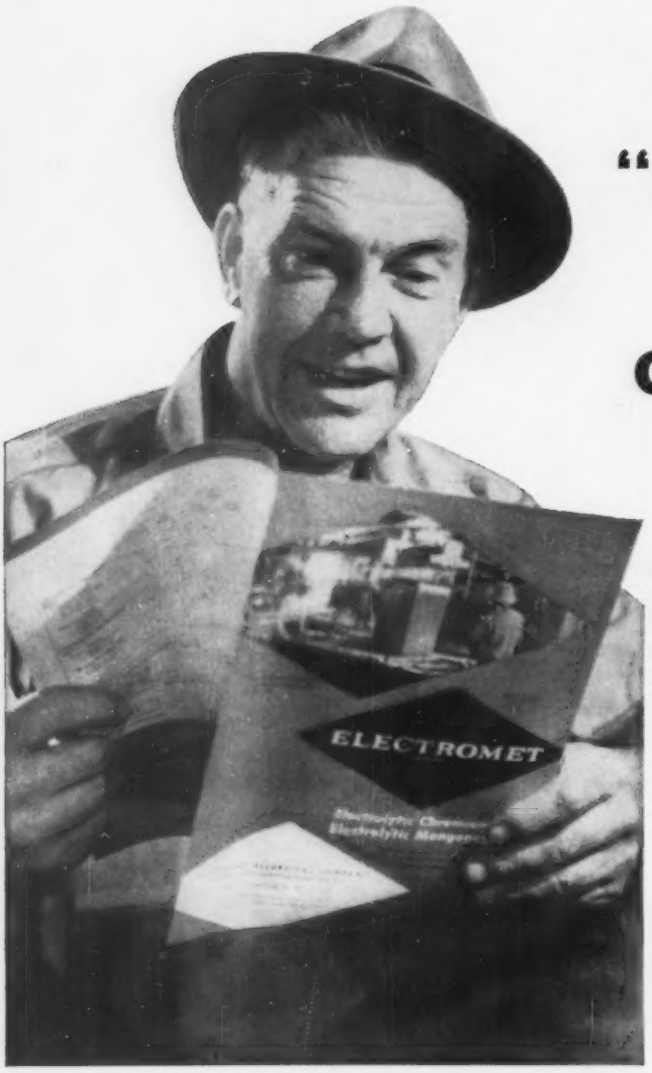

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and PRODUCTION METHODS at York are real cool too, man!

No matter how you say it, the facts are easy to understand—York assembles the entire chassis and wrapper for three different size air conditioner units with unusual efficiency and at minimum cost. And they do it all with Sciaky resistance welding techniques—developed to put profits back into manufacturing!

That enviable combination of good design and low cost is giving York's cool comfort to more summer-bound families than ever before. Not even the toughest assembling operations can disturb *your* sleep this summer if *you* take advantage of Sciaky resistance welding techniques—just like York does!

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Largest Manufacturers of Resistance Welding Machines in the World

Turn the page and see how York's doing it.....

The Sciaky technique of resistance welding used by the York Corporation, York, Pennsylvania.

Complex air conditioner chassis assembly costs cut 34.5%... Multi-part wrapper assembly costs cut 60.9%

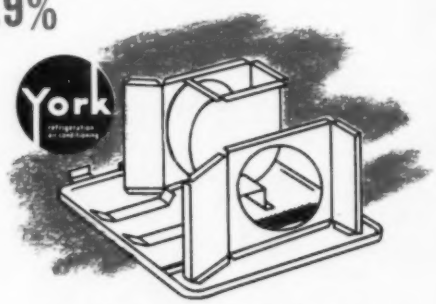
Sciaky Resistance Welding Techniques simplify operations, increase production, and facilitate model change-over at York Corporation

Integrated, standard Sciaky welders and a simple multiple gun welder assemble the entire chassis and wrapper for the one-half, three-quarter, and one ton size York air conditioners.

This Sciaky technique of fabrication, producing 90 assemblies per hour, permits tremendous production increase *without* basic equipment change. And seasonal model change-over is readily accomplished.

Put the Sciaky concept of resistance welding to work on your product ... your result—*more useful work* at *lowest operating cost* with *maximum reliability!*

Write for your free copy of "Resistance Welding At Work", Vol. 4 - #10 for all the details of the development and use of the Sciaky technique of assembly at York.



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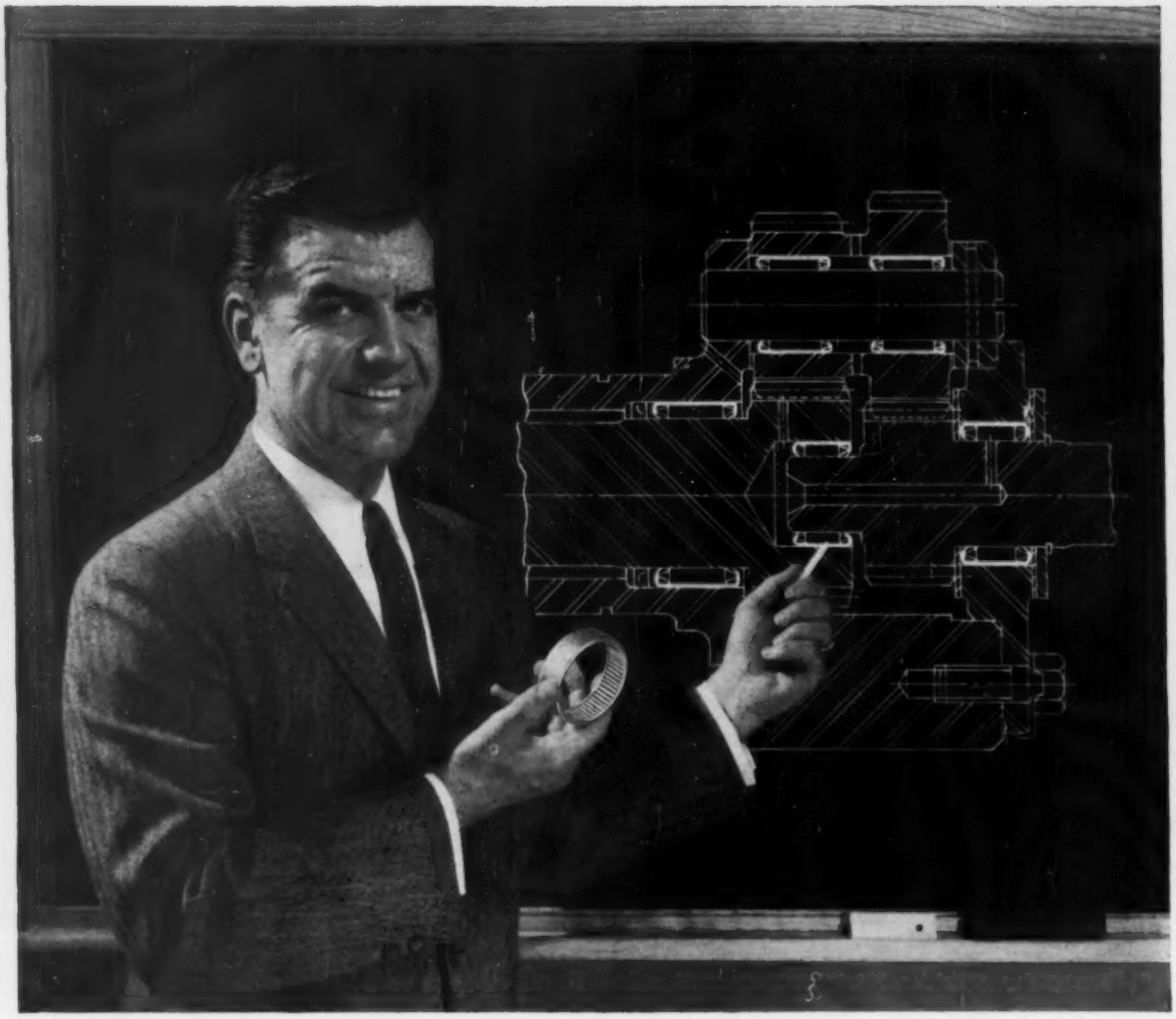

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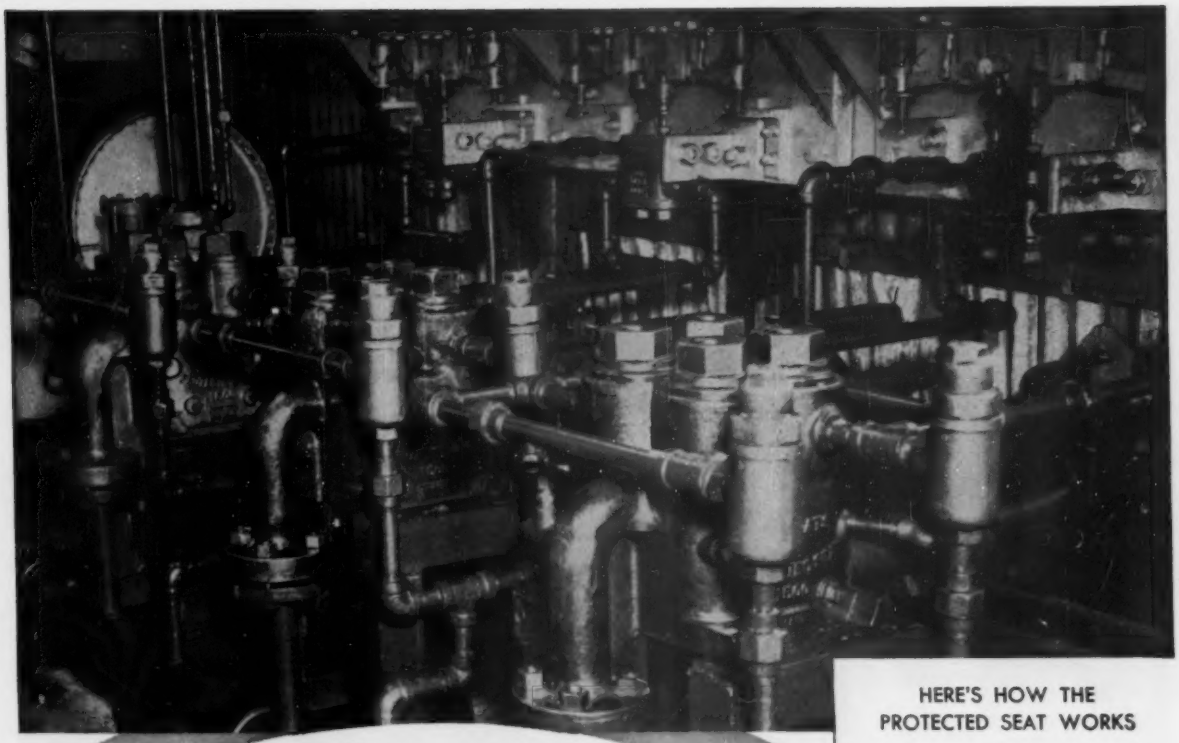

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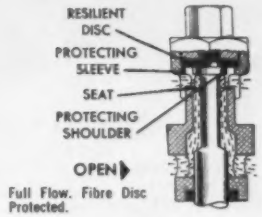

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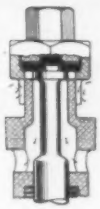

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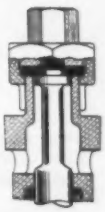

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Protected resilient disc against metal seat assures drop-tight seal, long life, accurate control, and low maintenance.

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The crankshaft harnesses 6190 horsepower developed by this Nordberg 12 cylinder Diesel engine to generate 4840 gross kilowatts of electric power.

Forging Weight 108,460 Pounds
Finished 12 Throw Crankshaft
46,400 Pounds

FROM a giant 210,000 pound, 72 inch ingot, poured at Erie Forge & Steel, came this 12 throw crankshaft . . . the largest ever made.

Within our plant this giant was machined down to 46,400 pounds fighting weight; the finished crankshaft is 43 feet 9 inches long by 15½ inches journal diameter. Bearing surfaces are polished to a mirror finish.

It is one of many such forgings followed step by step from raw material to shipping dock within the Erie Forge & Steel Corporation's plants.

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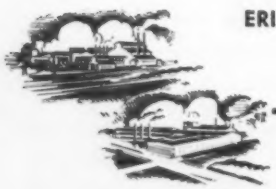

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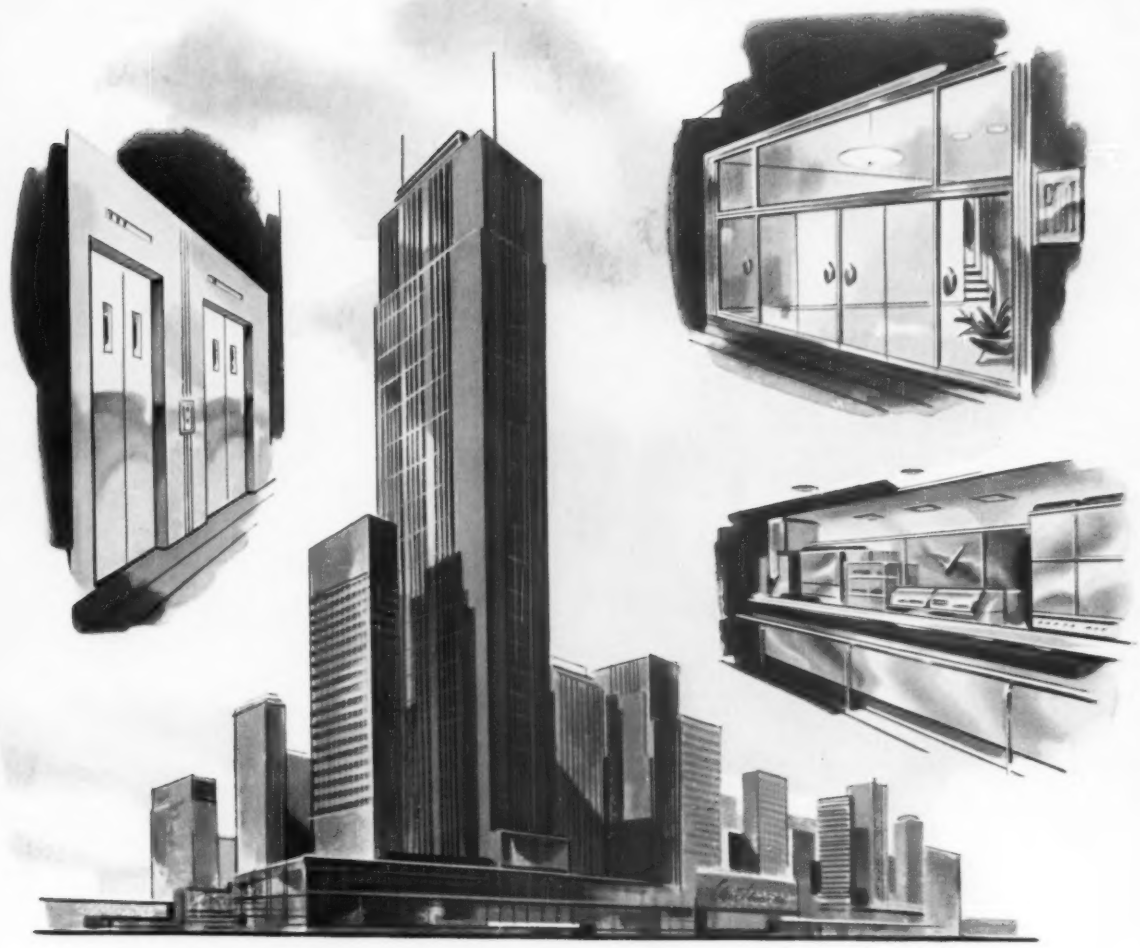

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the builder likes working with Stainless Steel. It is easy to install, does not dent, peel or discolor and presents no problem on matching or replacement.

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For the product you make today and the product you plan for tomorrow specify McLouth high quality sheet and strip Stainless Steel

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(Advertisement)

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER I—Decorative, Corrosion-Resistant Finishing with Iridite

Chromate conversion coatings are well known and accepted throughout industry as an economical means of providing corrosion protection, a decorative finish or a good paint base for non-ferrous metals. However, continued developments are so rapid and widespread that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this digest of current information; to bring you up to date on the many ways in which you can combine salable appearance with durability in one finish at a competitive price advantage. Report II on paint base, corrosion-resistant finishes and Report III on chemically polished, corrosion-resistant finishes are available on request.

First, as a basis for this discussion, a "decorative" finish is considered as any chromate film that is used as a final finish in itself. It may be truly decorative in that its sole purpose is to enhance the beauty of the product. For example, a bright chrome-like finish or a pleasing bronze appearance are among the many effects that can be obtained. It may be functionally decorative in that it reduces reflectivity for camouflage purposes or provides a means of color-coding parts. But, in all cases, the Iridite films protect the metal against corrosive attack.

Iridite finishes are now available for all commercial forms of the more commonly used non-ferrous metals, including zinc, cadmium, aluminum, magnesium, silver, copper, brass and bronze. These films can produce a wide variety of pleasing appearances. The basic colors of the Iridite coatings are grouped below by metals.

ZINC and CADMIUM: Metallic bright, light iridescent, iridescent yellow, bronze, olive drab.

COPPER, BRASS, BRONZE: Metallic bright, yellow.

ALUMINUM ALLOYS: Clear, iridescent yellow, brown.

MAGNESIUM ALLOYS: Metallic bright, iridescent yellow-red, brown.

SILVER: Metallic bright.

In addition, many films can be modified by bleaching or by dyeing. Among the dye colors available are various shades of red, yellow, green, blue or black.

Depending upon the metal and the Iridite used, corrosion resistance of clear and bright films ranges from mild passivity to as high as 500 hours in salt-spray; on heavier dark films, salt-spray resistance ranges from approximately 100 to 1000 hours.

It is this combination of decorative and corrosion resistant properties that accounts for the widening use of Iridite finishes. For example, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, a combination of lustrous chemical polishing of the as-cast surface of zinc die castings and good resistance to corrosion. Further, in many cases, sizeable savings in the cost of buffing and electroplating are realized.

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

On many steel parts, a simple system of zinc or cadmium plate and bright Iridite is used instead of more costly electroplated finishes to provide a bright, decorative and protective finish with tremendous savings in material, equipment and labor.

In finishing aluminum, where corrosion resistance or paint adherence is the prime consideration, the aircraft industry has all but abandoned the anodizing process in favor of recently developed chromate conversion coatings, among them Iridite #14 and #14-2 (Al-Coat). These formulations and their method of application can be varied to retain the original metallic appearance while providing acceptable corrosion resistance, or to produce a fully colored brown finish that offers exceptional corrosion protection. Again, time and manpower savings are astounding—one company saved at least $15,000 a year on maintenance of racks alone and another $40,000 on materials and labor in only nine months. In addition, of course, hundreds of thousands of dollars are saved by eliminating the need for expenditures for generators, heating equipment and racks.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

In planning or designing, you should consider the many other characteristics of Iridite finishes which may enter into the specific problem. In addition to having decorative and protective functions, these chromate coatings form an excellent base for organic finishes and bonding compounds. They have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product requires the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 E. Monument Street, Baltimore 5, Maryland.

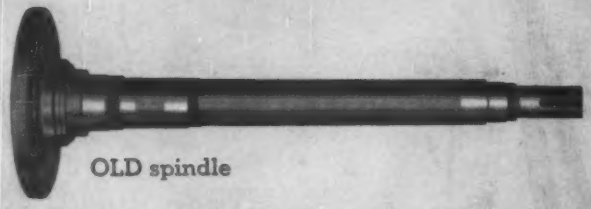
NEW 2H30 Double Spindle Grinder . . .

new spindle design improves precision—stability increased by 500%

grinds **TWO** parallel surfaces in **ONE** operation

NEW heavier spindle

500% increase in stability at rim of 30" disc



OLD spindle

Heavier spindle design in comparison with old spindle clearly shows why new 2H30 gives improved precision grinding. Note shorter spindle length combined with greater cross-sectional area that gives greater rigidity and stability. Send for your copy of the catalog describing this new Double Spindle grinder.

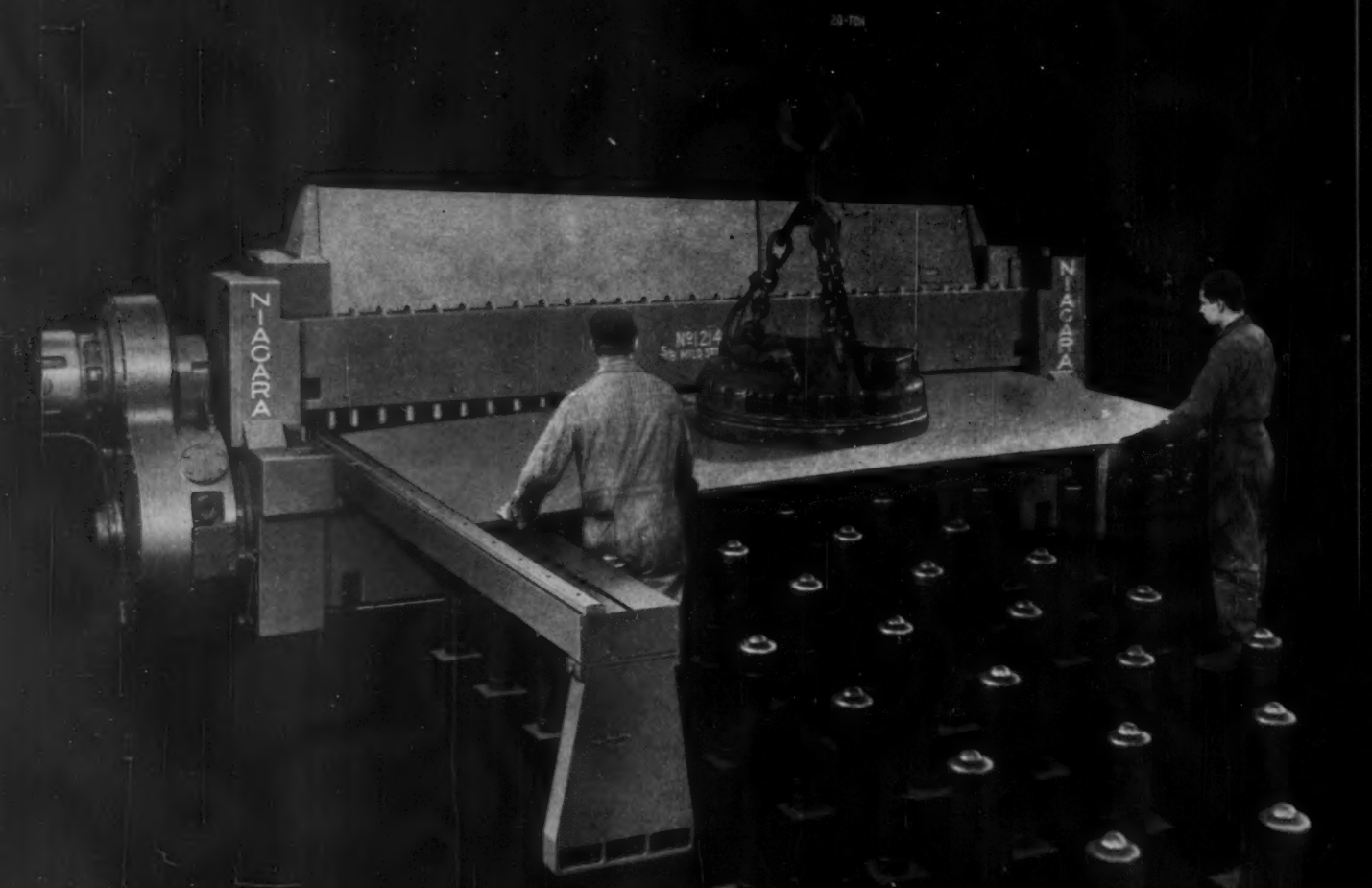
GARDNER

precision disc grinders

BELOIT, WISCONSIN

America's oldest, leading shear

the most in accuracy, speed



NIAGARA

POWER SQUARING SHEARS

builder offers you

and thrifty performance

One of the greatest values of a Niagara Power Squaring Shear is the unequaled experience of its builder. Niagara has been making shears for more than three quarters of a century.

Today, as in the past, the oldest leading name in shears stands also for the most modern in shear design. Niagara has continually set the pace in offering the most of **things which count the most** in dependable shear performance.

why YOU GET THE MOST IN ACCURACY:

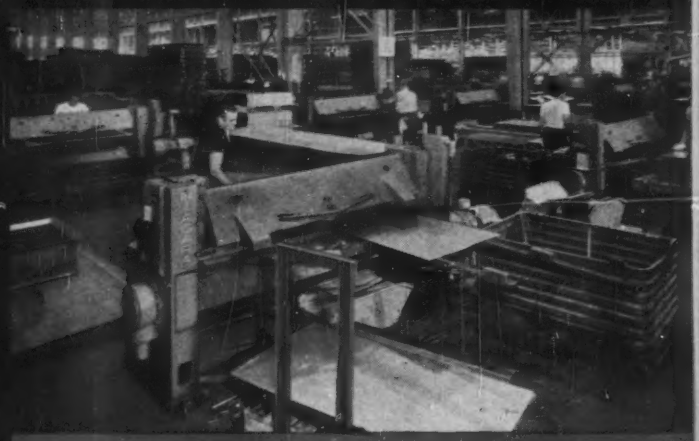
- With the cutting line fully visible, the positive power actuated, self-compensating holddown grips work securely. Multiple pressure feet on 6" centers apply uniform pressure, contacting the work with low impact to safeguard material and bed against damage. Long or short work is held tight against the bed. There's no rippling of the sheet as the keen edged, low-sloped upper knife shears through . . . clean and smooth.
- Niagara's fully closed box section construction of bed, crosshead, holddown and housings plus ample and accurately held crosshead guides resist horizontal, vertical and torsional stresses with minimum deflection.
- Edges are trimmed straight and true within micrometer tolerances. Blanks, too, are cut accurately to size and shape without making compensating allowances when setting gages. Only a Niagara Shear possesses **all** of the necessary features to insure maximum accuracy!

why YOU GET THE MOST IN SPEED:

- More working strokes delivered per minute and instant engagement of the Niagara Sleeve Clutch assure more cuts per hour. In continuous feed shearing, quick release of the power driven holddown enables a strip to be cut at each stroke.
- There's no need to adjust knife clearance every time a different thickness of stock is cut. Individual holddown feet are self-compensating. Two sheets of different thicknesses can be cut at the same time with the same knife adjustment and with the same accuracy.
- Ease of operation, quick setting gages and confidence inspired by safety features further increase hourly output . . . and make a Niagara Shear a truly productive, profitable investment for you!

why YOU GET THE MOST IN THRIFTY PERFORMANCE:

- Simplicity of design, involving a minimum number of parts, cuts out costly maintenance. With less to go wrong, there's less to repair and replace.
- Vital parts of Niagara's driving mechanism (clutch, gearing, flywheel, eccentrics and detent) operate in enclosed oil-tight cases. Ideal lubrication and maximum safety are thus insured.
- With power transmitted from the drive through efficient spur gears and Niagara's instant engaging, multiple-point sleeve clutch, there are no sliding surfaces (such as in worm gears and friction clutches) to consume power, generate heat and wear rapidly.
- Niagara 4-cutting-edge knives, manufactured entirely within the Niagara plant, are uniformly tough to withstand hard usage and are promptly available.



Niagara Shears at work in Ohio plant of one of the major electrical appliance manufacturers.

MOST EXACTLY SUITED TO YOUR NEEDS, TOO!

To fit your requirements exactly, consult a Niagara representative. With over 7 dozen models available in capacities from shim stock to 1" mild steel and in cutting lengths from 3 to 24 ft., he'll be able to recommend the shear that's **right** for you.

ILLUSTRATED, FACT-FILLED BULLETIN 69 MAILED FREE ON REQUEST

It will give you detailed information on the complete, modern line of Niagara Underdrive Squaring Shears. Write for your copy today.

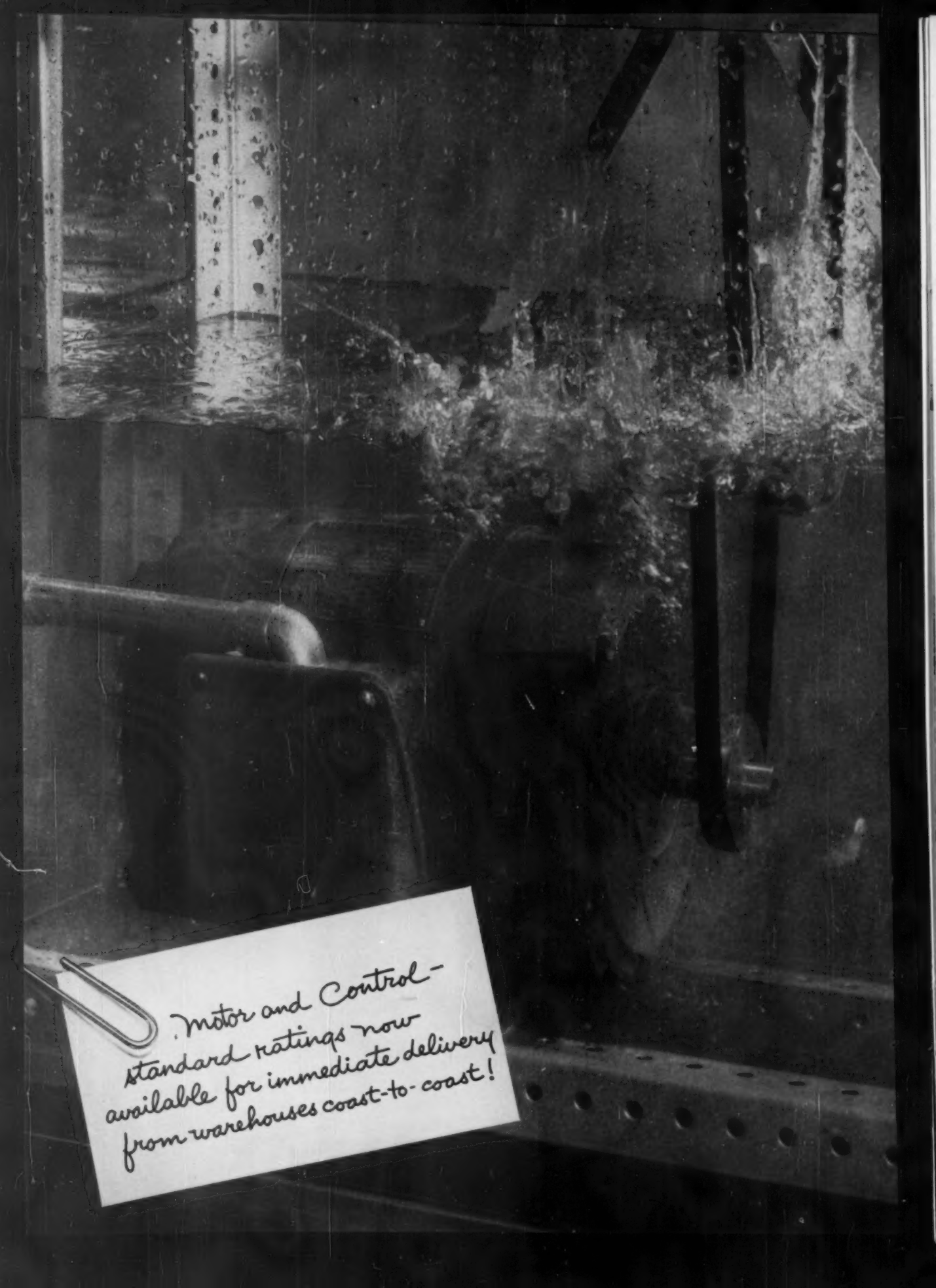
NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N.Y.

DISTRICT OFFICES

BUFFALO • CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA

Dealers in principal U. S. cities and major foreign countries

America's Most Complete Line of Presses, Shears, Press Brakes, Other Machines and Tools for Plate and Sheet Metal Work.


Motor and Control—
standard ratings now
available for immediate delivery
from warehouses coast-to-coast!

TOMORROW:

A Standard Motor That Can Live With Water?

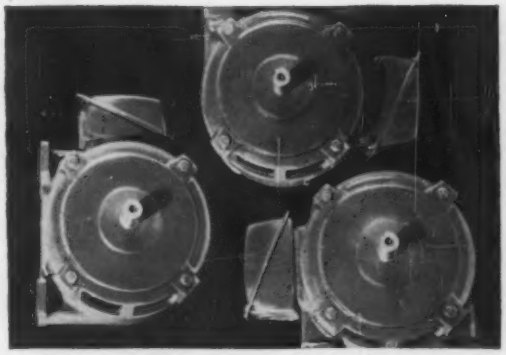
The New Life-Line A Is Another Step Closer

Today's standard motors cannot long endure the water conditions shown here. But Westinghouse is working toward a standard motor that can "live" with water like this tomorrow.

Meanwhile improved frame design, insulation and bearing protection give the Life-Line® "A" more protection than ever before. It can withstand more water and other contamination than any other motor you can buy. It's industry's closest approach to a standard motor that can operate with or within water—in any amount.

Your Westinghouse sales engineer can show you many additional reasons why the Life-Line "A" is industry's most advanced and preferred motor. Call him today.

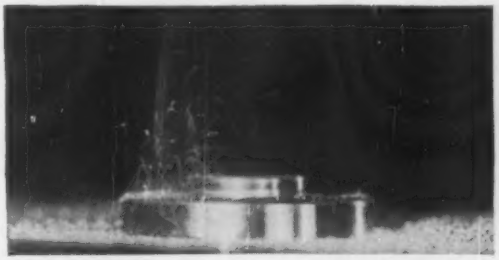
J-21924-A



New cast-iron frames and brackets utilize the finest grained castings with uniformly thick-walled sections precisely fitted and sealed—another reason why the Life-Line "A" is so preferred.

WATCH WESTINGHOUSE!

COVER THE PRESIDENTIAL CAMPAIGN ON CBS TV AND RADIO!



Two outer seals of new 4-way sealed bearing act as flingers and literally throw off damaging contaminations. Inner seals, attached to outer bearing race, are stationary and form a positive labyrinth.

GISHOLT

GISHOLT MASTERLINE NO. 12
AUTOMATIC PRODUCTION LATHE

MASTERLINE
GISHOLT SINCE 1887

Sixty-nine years of machine tool experience have gone into this latest design of the Gisholt MASTERLINE No. 12 Automatic Production Lathe. An important contribution to metal-cutting progress, it is ready to produce faster, better and at lower cost—with even less requirements for operator skill and effort. May we tell you the complete facts about it—and how it may be profitably applied to your manufacturing processes?

Gisholt Machine Company, Madison 10, Wisconsin

Look ahead—keep ahead—with Gisholt

Backbone of a Hundred Industries...

NATIONAL SEAMLESS

Crunching over the frozen Arctic in a tremendous cargo carrier is a far cry from fracturing the formation of a deep well in Texas. Yet, there is a definite link between them—NATIONAL Seamless, which makes them both possible. The versatility of NATIONAL Seamless Pipe and Tubes is almost unlimited because NATIONAL Seamless possesses all the fundamental *good* qualities which are so needed in so many industrial applications.

NATIONAL Seamless combines to the highest degree such vital qualities as strength, safety and workability. Uniform throughout and dimensionally accurate, NATIONAL Seamless Pipe and Tubes promise smooth installation and long satisfactory service. Available in a complete range of steel analyses, wall thicknesses and diameters, every foot is produced to exacting standards by the world's largest manufacturer of tubular steel products.

Bring your pipe and tubing problems to National Tube. Our engineers will be happy to provide any help they can.

1. This 252-mile gas line from Hebron, Pa., to Greenwich, Conn., was the world's first installation of National *Expanded Seamless* Line Pipe, a new product of National Tube. The 24-inch diameter pipe is easier to weld at all temperatures, yet possesses greater strength and uniformity than ordinary line pipe.

2. The LeTourneau Sno-Freighter is a giant, six-section, 125-ton capacity cargo carrier, designed to travel over ice, snow, bulldozed trails, or rough brush land. All of the car frames and coupling mechanisms were constructed from National's Shelby Seamless Mechanical Tubing.

3. 13,000 feet of National Seamless Deep Well Casing were used to fracture the formation of this non-producing oil well. Thousands of gallons of crude oil, sand, and flush oil were pumped down the hole at pressures up to 6,000 psi. In two days the well became a good producer. National Seamless Casing has the high collapse resistance and strength to withstand the intense pressures of just such jobs as this.

4. National Seamless Tubular Steel Piles provide low-cost support for heavy building loads. Their circular shape gives them outstanding strength, and, being hollow, they can be filled with concrete for greater loading capacity. They provide ideal foundations for roads, bridges and buildings.

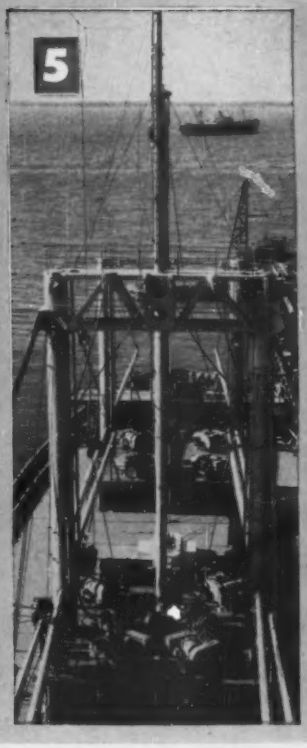
5. Marine Pipes and Tubes of National Seamless offer the greatest possible security as marine steam lines—bear up under high temperatures and intense pressures, year after year. National Seamless is strong, tough, uniform—has every qualification for any marine power piping system, small or large.

6. The National Seamless Method of manufacture is one of the most difficult forging operations in the steel industry. A billet of the finest steel is actually pierced to produce a seamless tube with absolutely uniform wall strength. No welds . . . no joints . . . no weaknesses.

SEE The United States Steel Hour. Televised alternate weeks. Consult your local newspaper for time and station.

UNITED STATES STEEL

PIPE AND TUBES



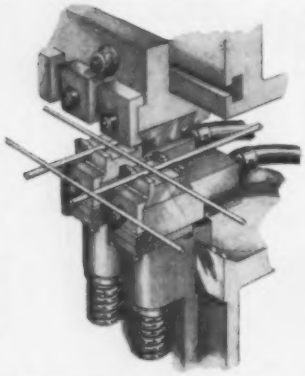
NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

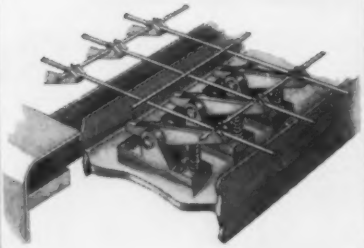
NATIONAL SEAMLESS PIPE AND TUBES

WALLS WITHOUT WELDS

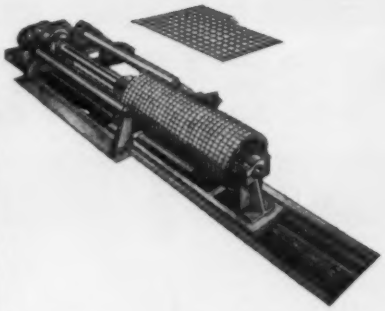
UNITED STATES STEEL



UNITIZED CONSTRUCTION of welding heads simplifies adjustment for mesh spacing and facilitates removal for maintenance. Up to 160 heads may be used.



FEEDER FINGERS advance the fabric between each series of welds. Position of the two sets of fingers is adjustable to suit the mesh spacing.



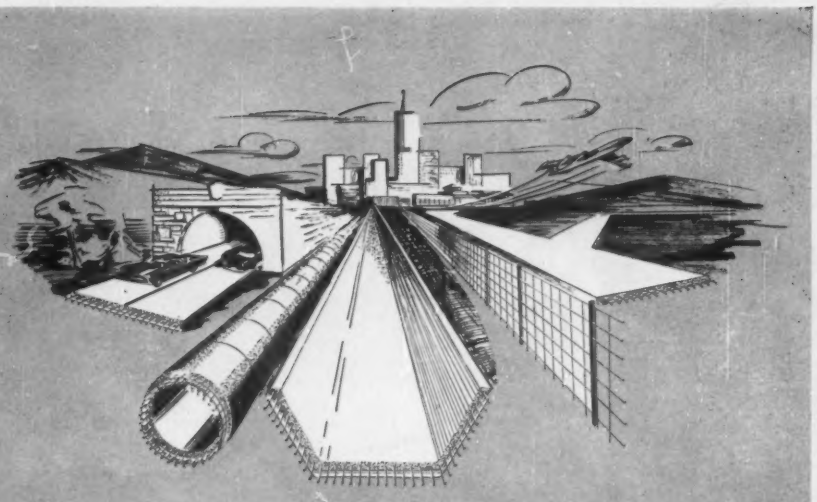
COIL UNLOADING is automatic. A full coil is shown moving out on the cradle which is designed for rapid unloading to permit continuous operation of the welder.

THE THOMSON WIRE FABRIC WELDER

turns out a mile of fabric every 90 minutes. Longitudinal wires are taken from coils, straightened in two directions, and fed to the welding station. Transverse wires are taken from a coil, straightened in two directions, fed into receivers, cut to length, positioned in the welding dies by "placer fingers", and welded at each intersection. "Feeder fingers" automatically advance the fabric through a selvedge trimmer and through the shear or to the coiler.

EVERYDAY USES OF WIRE FABRIC

Welded wire fabric is used to reinforce concrete highways, streets, sidewalks, floors, roofs, walls, beam wrapping, airport runways, pipe, irrigation canals, aqueducts, reservoirs and similar construction. It is also used as fencing, ranging from farm and lawn fence to poultry netting; for flooring, caging, partitioning and grillwork; and as the wire fabric component of many familiar products.



RESISTANCE WELDING
by the mile

An Example of Automation in the Production of Welded Wire Fabric

To supply the nation's appetite for welded wire fabric, Thomson has developed automatic welders which literally produce fabric "by the mile".

The giant fabric welder pictured here makes heavy concrete reinforcement. It turns out over a million square feet a week in widths from eight to sixteen feet in a wide variety of mesh spacing and wire gauges.

It takes the raw material in coils just as it comes from the steel mill and delivers the finished product in rolls or sheets. Rolls are mechanically off-loaded and sheets are automatically sheared into mats of specified lengths.

The Wire Fabric Welder is one of many types of special purpose welders for which Thomson is the recognized source throughout industry. It is also a fine example of automation applied to resistance welding.

A Thomson man will be glad to discuss with you ways to reduce or eliminate work handling in your resistance welding operations. Here is an area in which you can enjoy the advantages and economies of automation *right now*.

FOUNDED IN 1846 BY ELIHU THOMSON

INVENTOR OF RESISTANCE WELDING

THOMSON *Welders*

THOMSON ELECTRIC WELDER COMPANY, LYNN. MASS.

Thomson also makes a complete line of standard spot, projection, seam and flash-butt welders. Also, aircraft, brake shoe, shell and other special purpose resistance welders.

GIANT SIZE!

THE GIANT SIZE Sellers Floor Type Horizontal has:

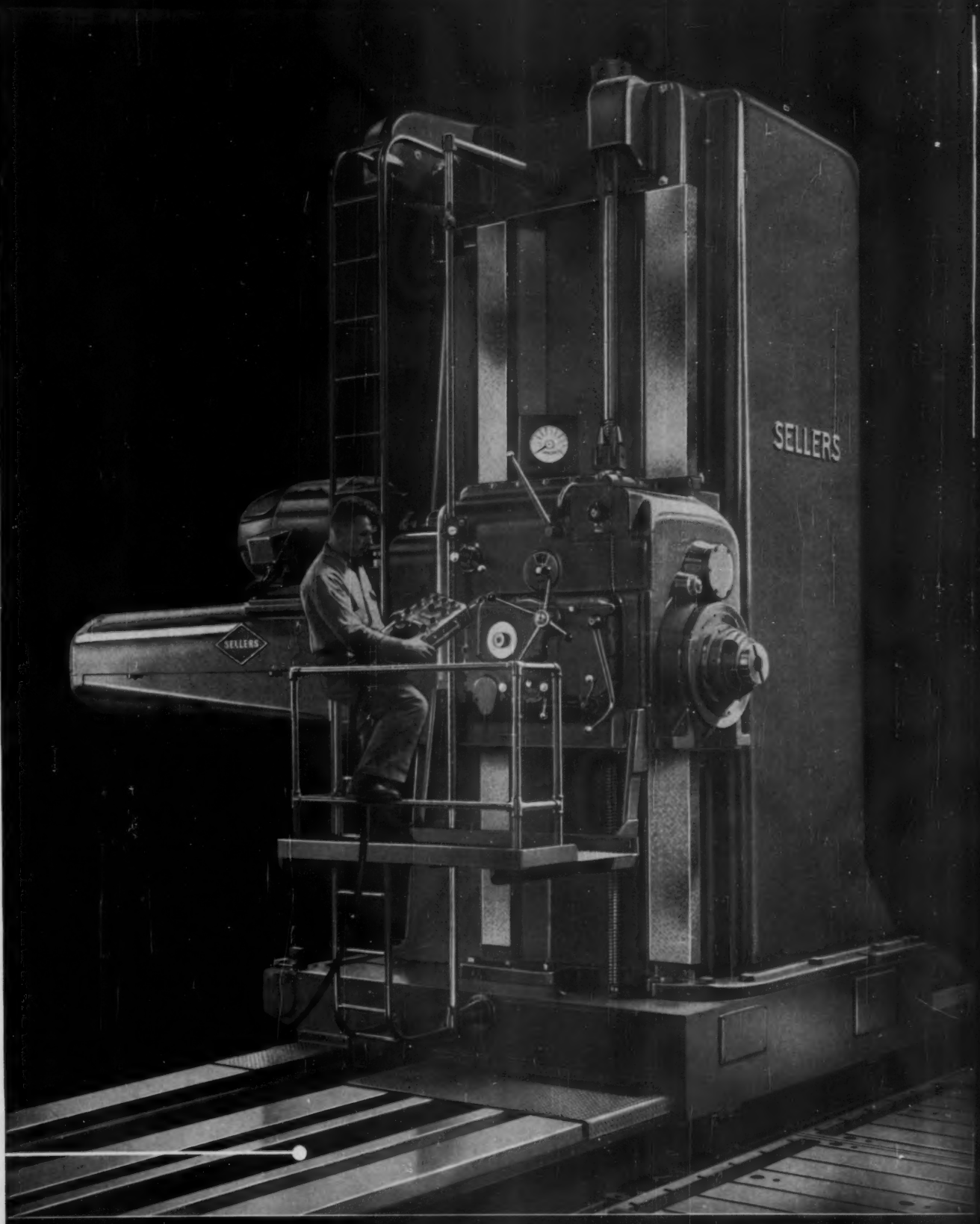
A 10 inch diameter spindle
An 8 foot spindle feeding stroke
A runway that measures 9 feet across the ways
A column that measures 4½ feet across its ways
Up to 15 feet of head travel on the column
A 100 horsepower driving motor

It is a big machine for big work, but with its electronic push-button control, it handles like a small one.

CONSOLIDATED MACHINE TOOLS FJB®

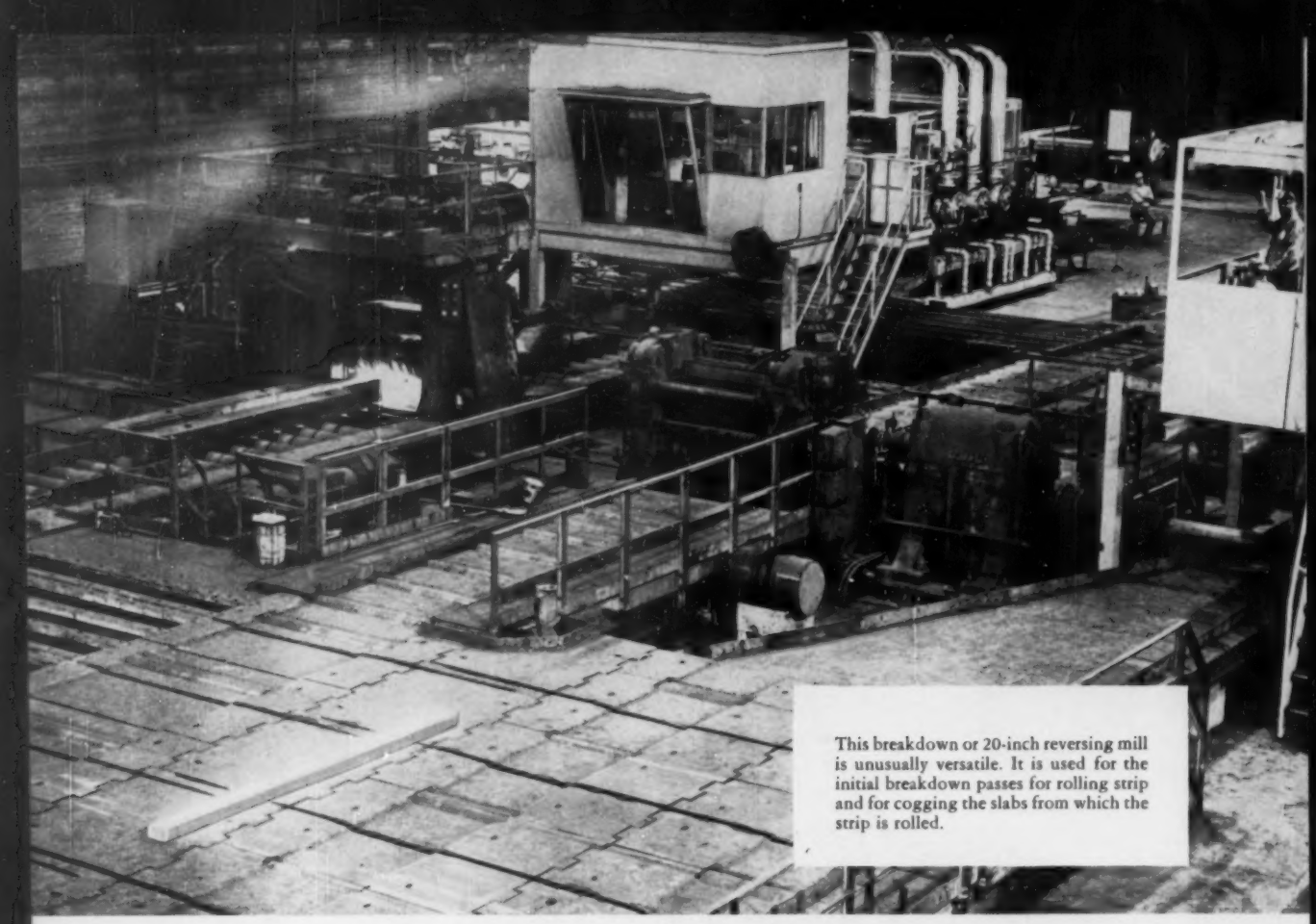
CONSOLIDATED MACHINE

A DIVISION OF FARREL-



TOOL COMPANY ROCHESTER 10, NEW YORK

BIRMINGHAM CO., INC.



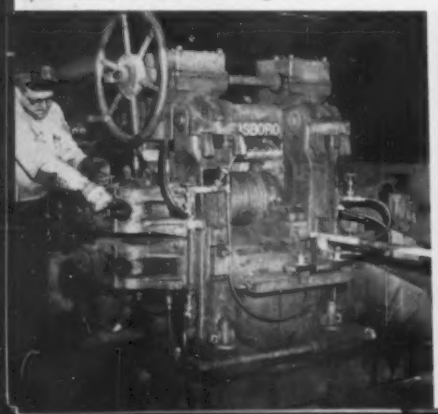
This breakdown or 20-inch reversing mill is unusually versatile. It is used for the initial breakdown passes for rolling strip and for cogging the slabs from which the strip is rolled.

Steel producer picks new **BIRDSBORO** bar, strip and rod mill design to meet "Expansioneering" Demands

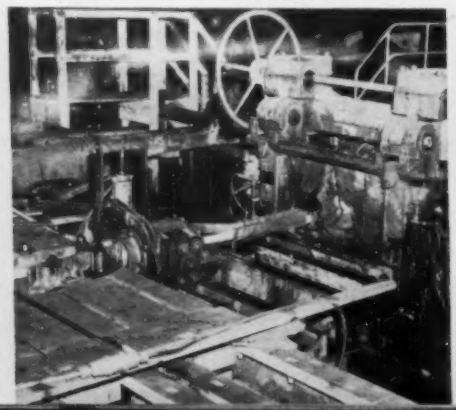
This steel maker needed more than a "standard" mill, since its specialty steel business required unique mill flexibility to render maximum customer service. Special tolerances and highest product quality must be produced quickly, in profitable quantities, with as many automatic operations as possible.

BIRDSBORO was called in on the job because an exacting combination of engineering features was required. Ruggedness, plus the versatility to permit many refinements in the production of steel bar, strip and rod, was a major requirement. Once again, Birdsboro engineers delivered exactly what the producer ordered plus the extra touches that resulted in maximum production efficiency, both in quantity and quality.

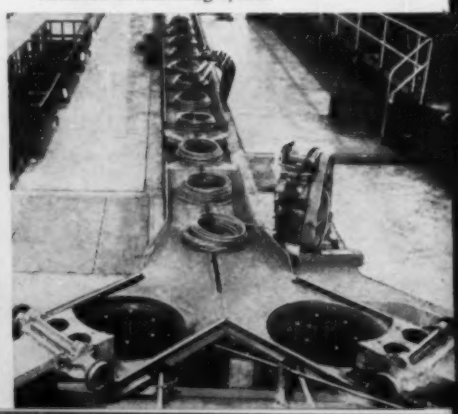
Close size and shape control is gained to micrometer accuracy through end thrust adjustment on this finishing stand.

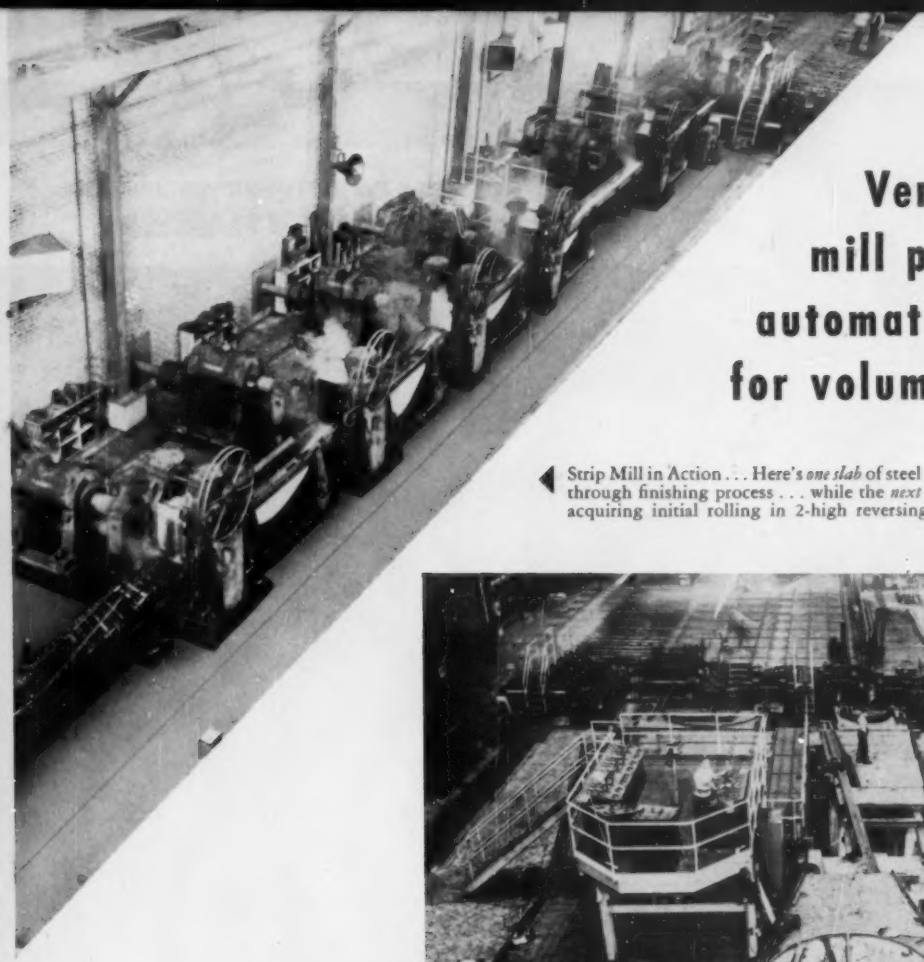


This oval turn-up device on the rod and bar mills eliminates manual stranding common in older types.



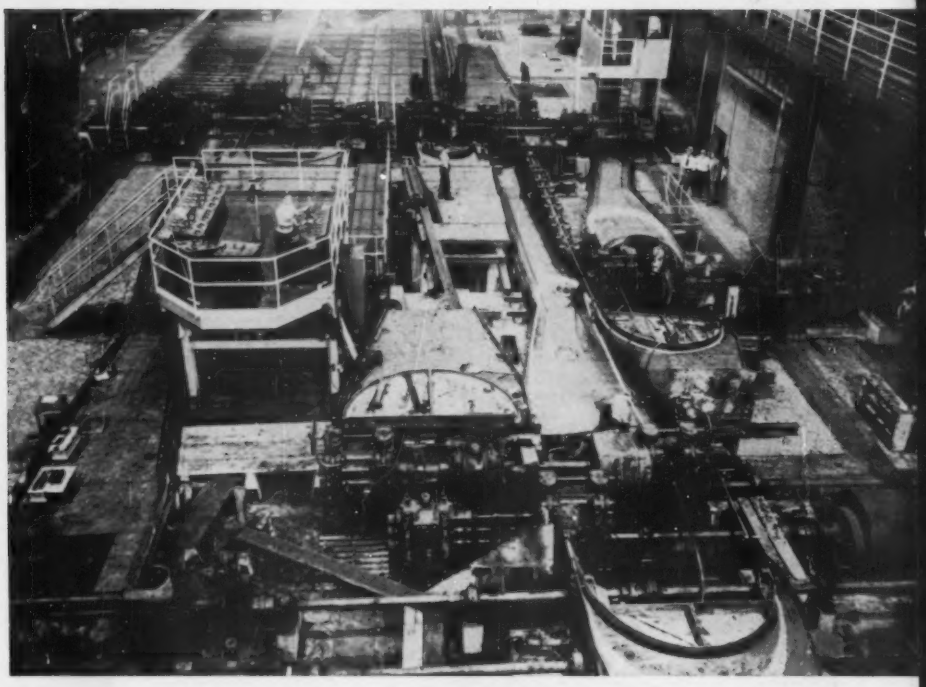
Conveyor table, delivering coils of rods to loading point. Coils are moved separately for individual cooling which helps produce uniform structure in annealing cycles.





Versatile 3-way mill provides speed, automation and accuracy for volume production

Strip Mill in Action . . . Here's *one slab* of steel going through finishing process . . . while the *next slab* is acquiring initial rolling in 2-high reversing mill.



The Continuous looping method is used to roll rods. The rod at upper left is in initial breakdown, while the loops to the right are in the finishing stage. Loops are closely controlled in a small area, aiding in size control and permitting compact design installation.

Not just machines, but ideas, too!

. . . Ideas applied to mill machinery problems that can provide not only a solution, but production advances . . . the advances that will keep your plant profit picture bright for years to come. While your "expansioneering" is still in the planning stage, call in a BIRDSBORO representative. He and the experienced staff that backs him have the design ideas you can profitably apply to your operation.

DESIGNERS AND BUILDERS OF:

- STEEL MILL MACHINERY
- HYDRAULIC PRESSES *(Metalworking and Extrusion)*
- CRUSHING MACHINERY
- SPECIAL MACHINERY
- STEEL CASTINGS
- Weldments "CAST-WELD" Design
- ROLLS: Steel, Alloy Iron, Alloy Steel

MM-52-96

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., Main Offices in Birdsboro, Pa. District Office: Pittsburgh, Pa.

New York Office: Engineering Supervision Co., 120 West 42nd Street, New York 36, N.Y.

GET ZINC COATING PROTECTION
MASS PRODUCTION FORMING processes have no effect on the uniform, tight zinc coating of Republic Continuous Galvanized Sheet Steel. Result is long-lasting corrosion protection without costly dipping. Further finishing can be eliminated.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

WITHOUT COSTLY DIPPING AFTER FABRICATION with REPUBLIC Continuous Galvanized Steel

If the expense of hot dip galvanizing after fabrication is blocking your efforts to cut costs—or keeping you from giving your products the corrosion protection they should have, here's good news: The tight, corrosion-resistant zinc coating of Republic Continuous Galvanized Sheet Steel will not crack, flake or peel under any forming process permitted by the base metal.

Result: Your parts or products are completely protected by a uniform, tight zinc coating, at far less cost than old-fashioned, hot dip methods allow.

Republic produces a truly adherent zinc coating by maintaining positive control through all steps of the continuous galvanizing process. These include both acid and alkali cleaning, uniform flux application, correct molten zinc turbulence plus addition of aluminum to secure ideal iron-zinc alloy at junction of base metal and zinc coating. In addition, exacting inspection and testing procedures double check all operations to assure consistent quality throughout every order, every time. Forming operations are limited only by the physical characteristics of the basic steel sheet specified.

Get all the facts on Republic Continuous Galvanized from your Republic representative, today. He will be glad to help you capitalize on the advantages of this new production line material—or recommend use of still other Republic Sheet and Strip Products including Electro Paintlok®, Galvannealed and ENDURO® Stainless Steel.

For complete information, mail coupon.

OUTSTANDING FINISH PLUS ECONOMY are major advantages of using Republic Electro Paintlok for these water-cooler housings. Since sheets as produced are ready for painting, often only a minimum of cleaning is necessary, and in many cases priming operations can be eliminated. In such instances one coat of paint and one trip through drying oven produce a top-quality, tightly adhering finish. Also, if finish is scratched through, the coating on Electro Paintlok limits corrosion to point of damage.

LIFETIME CORROSION-RESISTANCE, plus ease of maintaining high sanitation standards, make Republic ENDURO Stainless Steel the ideal material for this unique beverage dispenser. In addition, ENDURO provides sales-boosting beauty. Its high strength-to-weight ratio allows use of lighter gages without impairing ability of completed unit to withstand rugged service. Send coupon today, for production and application information.

REPUBLIC STEEL CORPORATION
Dept. C-2362
3104 East 45th Street
Cleveland 27, Ohio

Please send me further information on

- ☐ Continuous Galvanized
- ☐ Electro Paintlok
- ☐ ENDURO Stainless Steel

Name_____ Title_____

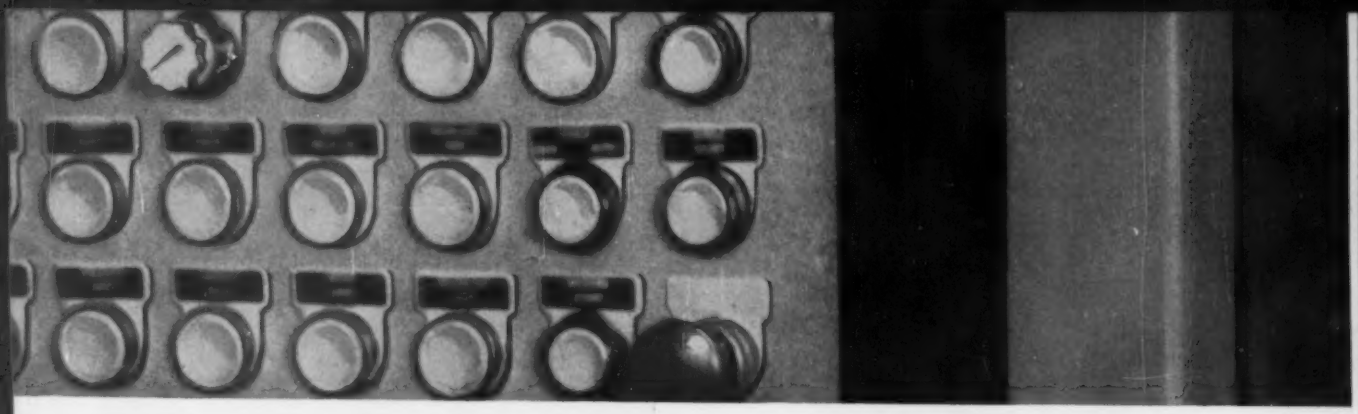
Company_____

Address_____

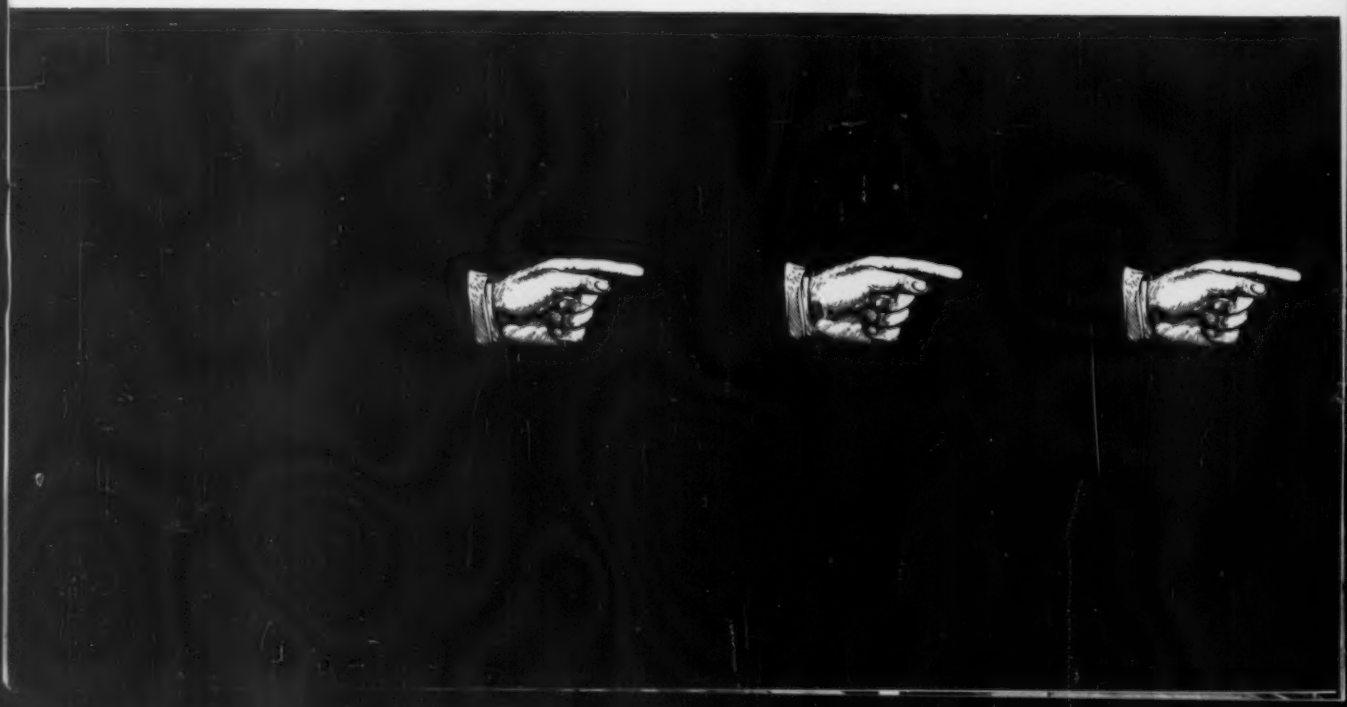
City_____ Zone_____ State_____

STEEL

and Steel Products



PUSH-BUTTON ECONOMY



Yesterday, Jones & Lamson broke through the speed barrier with high-velocity metal turning.

Today, advanced engineering at Jones & Lamson again pioneers in attacking a critical cost consideration: the *man-hour* factor.

Here are a few of the engineering innovations which are strategically important for (1) minimizing operator fatigue and human error (2) speedy change-over and retooling, and (3) push-button simplicity of operation:

In Turret Lathes: Geneva saddles and Hydra-Clutch headstocks; automatic thread chasing; one- or two-way tracing combined with normal Turret Lathe operation; Numerical Tape Control for Automatic Turret Lathe.

In Automatic Lathes: Automatic handling; feed-back; gaging; sorting; chip disposal.

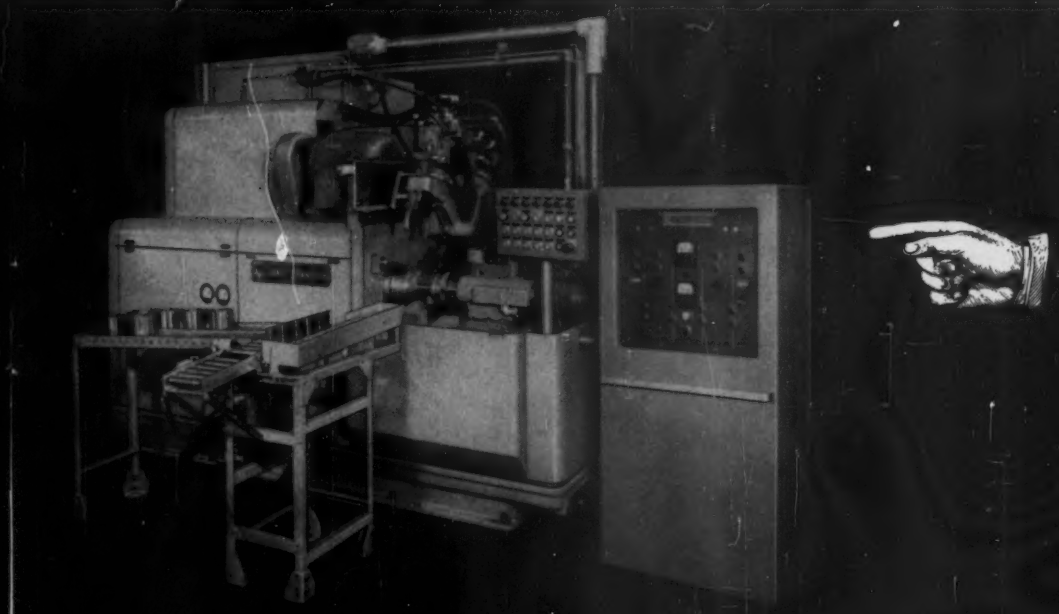
In Grinders: Automatic Tap Grinders; Optical Contour Grinders; automatic handling for Thread and Form Grinders.

These are typical results of our all-out efforts toward machine design that will reduce costs, increase production, and keep both operators and management happy.

The man who needs a new machine tool is already paying for it.

JONES & LAMSON MACHINE CO • 511 CLINTON ST • SPRINGFIELD, VT.

Turret Lathes *Fay Automatic Lathes* *Milling & Centering Machines* *Thread & Form Grinders* *Optical Comparators* *Threading Dies & Chasers*



BLAW-KNOX

makes what it takes

to hot roll high-tonnage

top quality sheet

This CONTINENTAL 80-inch, 6-stand continuous hot strip mill in the United States Steel's Gary Sheet and Tin Mill was designed and engineered for heavy duty and high-speed finishing. It is well-known throughout the industry for excellent tonnage performance and quality.

In addition to these large mills, Blaw-Knox builds single-stand reversing hot strip finishing mills, complete with all auxiliaries.

Blaw-Knox designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

BLAW-KNOX COMPANY
Foundry & Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

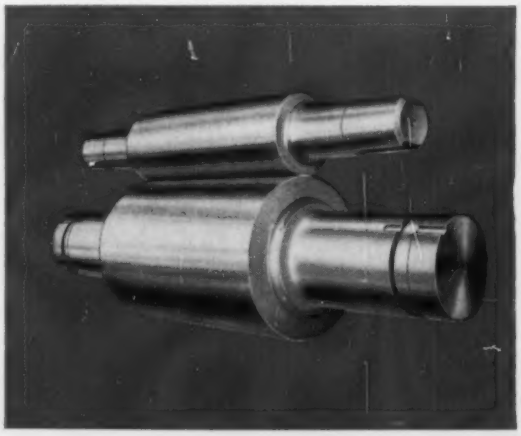
Complete rolling mill installations . . . including all auxiliary equipment . . . for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills . . . roll lathes • chippers • special machinery • and complete auxiliary equipment

50th Anniversary
BLAW-KNOX
1906-1956

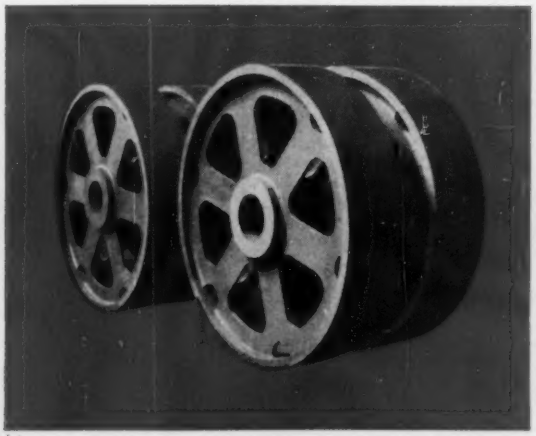
CONTINENTAL

ROLLS—Iron, alloy iron and steel rolls for all types of rolling mills.

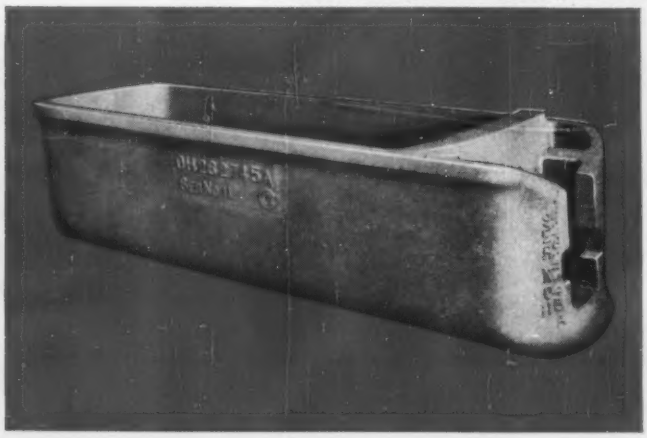


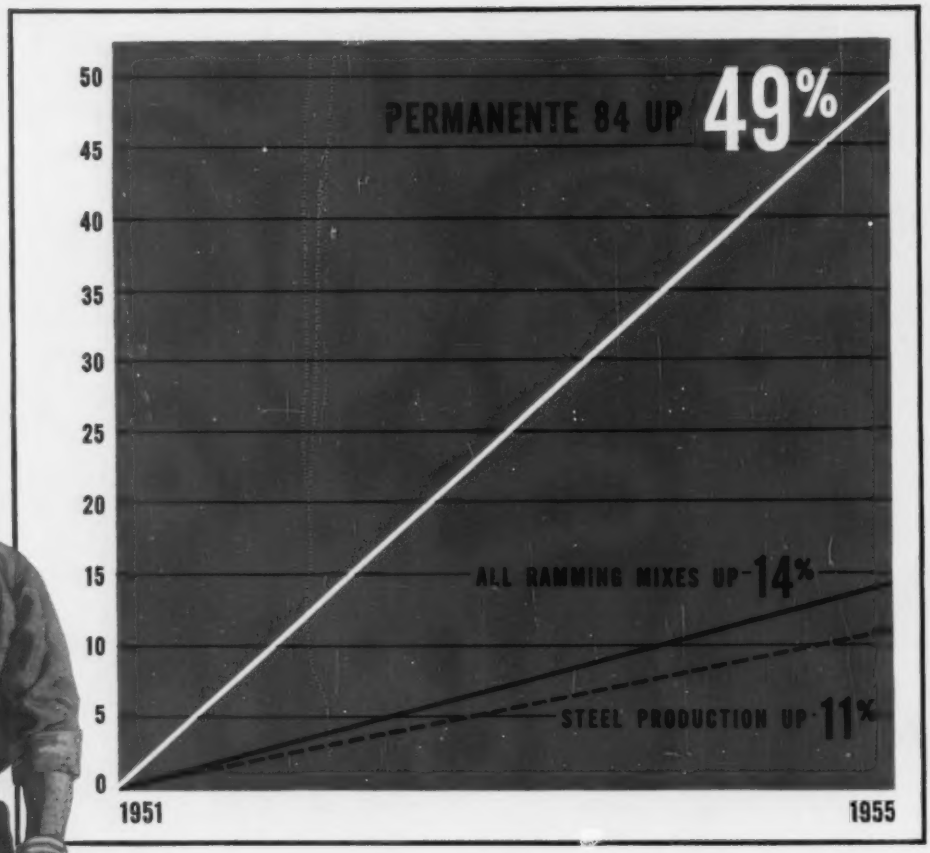
CONTINENTAL 80-inch continuous hot strip mill in the Gary Sheet and Tin Mill of the United States Steel Corporation.

WELDMENTS—fabricated steel plate, or cast-weld design.



CASTINGS—carbon and alloy steel castings from 20 to 250,000 pounds.





Why this growing preference for Permanente 84 Ramming Mix!

As you can see from the chart above, sales of all ramming mixes to steel producers increased only 14% during the five year period ending December 31, 1955.

But during this same period, sales of Permanente 84 Ramming Mix increased *a whopping 49%*!

Why is Permanente 84 increasingly preferred by leading steel producers?

Briefly, here are the reasons:

Permanente 84 reduces the cost of maintaining furnace bottoms and banks. Repairs made with Permanente 84 stay put! Down time for hot-repairs is reduced because repairs made with Permanente 84 last longer. Steel production goes up—costs come down. Ideal for hot patching both open hearths and electric furnace banks and bottoms.

Order Permanente 84 now, and get extra steel tonnage at lower cost.

For more information call our nearest Sales Office: Kaiser Chemicals Division, 1924 Broadway, OAKLAND 12, Calif. . . . 3 Gateway Center, PITTSBURGH 22, Pa. . . . 518 Calumet Bldg., 5231 Hohman Avenue, HAMMOND, Indiana.

To obtain free copies of Kaiser Chemicals product literature write Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, OAKLAND 12, California, Dept. R6112.

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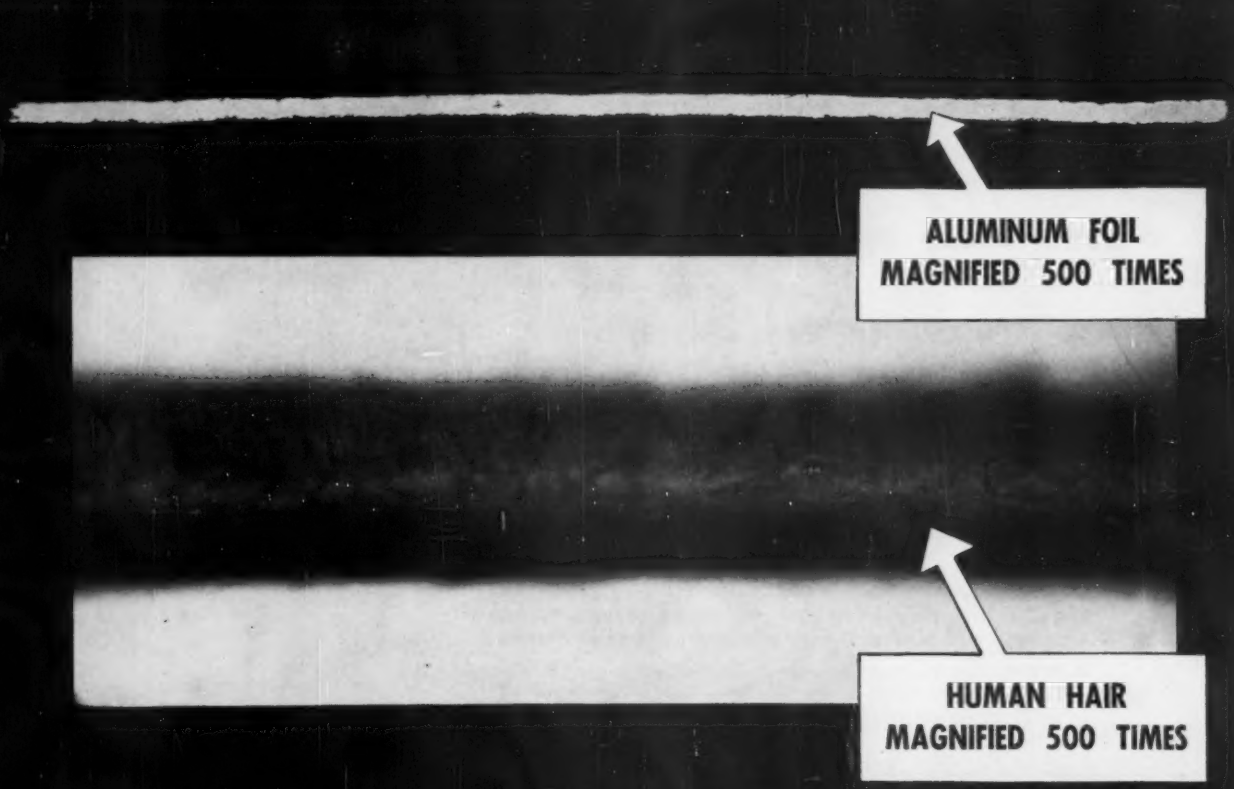
Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite



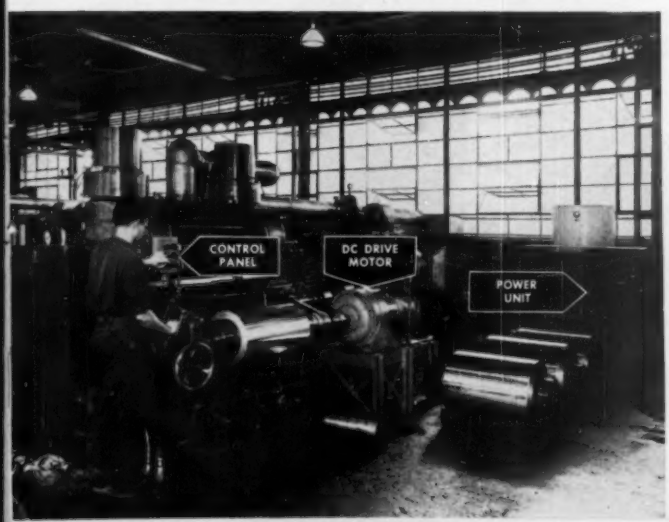
General Electric d-c drives help

Roll aluminum 1/10 the thickness of human hair

A GENTLE TOUCH—Rolling high-quality aluminum to 1/10 the thickness of a human hair takes a gentle touch. Doing it 24 hours a day, six days a week demands sturdy, reliable equipment. To obtain this combination of sensitivity and dependability Republic Foil and Metal Mills, Danbury, Conn., has installed five General Electric Speed Variators on their pay-off drives.

REDUCED DOWN-TIME—Mr. James D. Post, Vice President in Charge of Operations, reports, "The General Electric Speed Variators provide more constant tension and steady acceleration. As a result, down-time and maintenance have been reduced on this delicate work. We also like the way they stand-up under continuous operation. Our satisfaction is manifest in a duplicate order for our No. 5 mill."

THREE COMPONENTS of G.E.'s Speed Variator are shown installed on the pay-off drive at Republic Foil and Metal Mills.



SPLIT-SECOND RESPONSE—General Electric Speed Variators are proving the answer to a variety of difficult metal rolling and slitting applications in brass, aluminum, and steel. Providing smooth, steady acceleration and split-second response to control signals, they can meet the most exacting drive requirements.

ENGINEERED TO YOUR SPECIAL NEEDS—The Speed Variator conversion unit comes assembled, wired and tested... ready to be installed on your a-c system. General Electric engineers will be glad to help you in making the most effective use of these drives. Please call your G-E Apparatus Sales Office or write for bulletin GEA-6127. *Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.* 820-2

Progress Is Our Most Important Product

GENERAL ELECTRIC

Wagner ELECTRIC MOTORS...the choice of leaders in industry

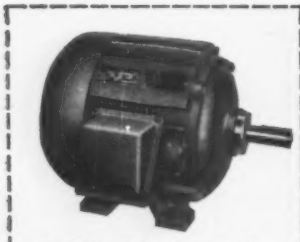
Wagner Protected Type
Industrial Motors

lower your maintenance costs—cut down-time

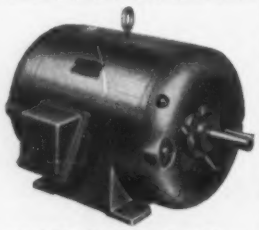
Wagner offers a complete line of protected type motors, specifically designed for use where severe conditions demand EXTRA protection—for bearings or windings... against corrosive vapors or abrasive dirt ...in explosive atmospheres or exposed outdoor locations.

In their specific applications, each of these Wagner Motors assures completely dependable performance—with a minimum of maintenance and a maximum of freedom from costly down-time due to motor failure. Openings are provided for relubrication to greatly prolong bearing life.

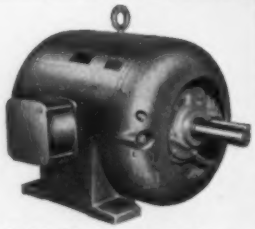
A Wagner engineer, expert on motor applications, will be glad to help you select the *right* motors for your specific needs. Just call the nearest of our 32 branch offices, or write for Wagner Industrial Motor Bulletins.



TYPE EP—Ribbed frame fan-cooled. New NEMA Frames. 1 to 30 hp.



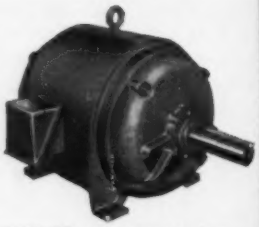
TYPE EP—Totally-enclosed fan-cooled. Corrosion-resistant frames. 40 to 250 hp.



TYPE JP—Fan-cooled . . . Explosion-proof. Cast iron frames. 40 to 250 hp.

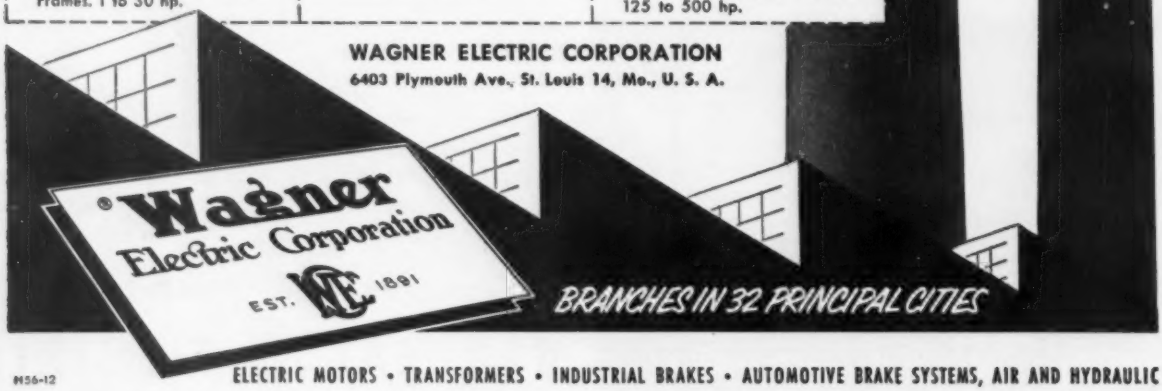
TYPE DP—Drip-proof . . . corrosion-resistant. New NEMA Frames. 1 to 30 hp.

TYPE DP—Drip-proof. Cast iron frames. 40 to 125 hp.



TYPE RP—Open-type drip-proof. Welded steel frames. 125 to 500 hp.

WAGNER ELECTRIC CORPORATION
6403 Plymouth Ave., St. Louis 14, Mo., U. S. A.



M56-12

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS, AIR AND HYDRAULIC

QUALITY REFRACTORIES AND INSULATION

GOOSE LAKE FIRE CLAY BRICK AND CLAYS

Ground Fire Clay. A smooth, high quality, plastic fire clay with low shrinkage for laying up fire brick and other fire clay refractories.

Fire Clay Flour. Extra fine preparation of clay for laying up the brick with tight joints and for molding sand bond.

Grundite Bond Clay. Special bond clay containing "Illite," a mineral that improves molding sands for malleable and gray iron castings.

Fire Clay Brick. Dense, well-burned plastic fire clay brick for iron and steel ladles, cupolas and for general intermediate heat duty requirements.

Firox Cupola Mix. New type mixture for lining cupolas and ladles by gun or hand application.

Castables. Refractory grog with hydraulic bonds for use as a concrete.

Chem-Brix CHEMICALLY BONDED - NOT KILN FIRED

Carbon. Chemically bonded Carbon Chem-Brix assure longer service and less spalling, especially for iron and Bessemer steel ladles.

Silica. New type chemically bonded silica brick with low porosity and greater density than other silica brick. It is more refractory and has excellent expansion properties to insure superior service life.

THERM-O-FLAKE HIGH TEMPERATURE VERMICULITE INSULATION

Coating. An insulating cement for application as a plastic on furnace brick-work exposed to temperatures up to 2000°F.

Brick. Molded vermiculite brick used for back-up insulation. Provides a strong, resilient cushion which absorbs expansion of refractory brick-work without disintegration.

L.B. Block. Pressed block with high insulating efficiency and unusual structural strength for use up to 1900°F.

Concrete. A prepared structural material containing vermiculite, Lumnite cement bond and specially selected refractory aggregates.

ILLINOIS CLAY PRODUCTS CO.

MAIN OFFICE: Barber Building, Joliet, Illinois • SALES OFFICE: 208 S. LaSalle Street, Chicago, Illinois

Vinson Steel and Aluminum Co.
Dallas, Texas says:

Shearing capacity of this machine is 12'-0" x ½" mild steel. Note accessibility of two cranks on right end housing. Upper crank is for knife adjustment. Lower one is for back gauge adjustment.

Adjustable Blade Clearance Allows Use of Shear for Complete Range of Thicknesses

THE feature that Vinson Steel and Aluminum Company likes best on their Steelweld Shear is the adjustable blade clearance. This permits them to use the one machine for their complete range of thicknesses. They go as low as 26 gauge galvanized material and up to ½ inch mild steel and ½ inch aluminum.

As a leading supplier of metal in North and West Texas, Vinson insists on cuts being sharp, straight and accurate. This requires that the blade clearance be correct for every thickness cut. Because of the unique easy method of adjusting the clearance on Steelweld Shears, the adjustment can be made in seconds.

Another item which is impressive is the low maintenance cost. This machine has been in service for over two years, and the maintenance has been practically nil.

More and more warehouses are installing Steelweld Shears. Usually one will handle a range of work that would require two or more other type machines not built with a fast knife adjustment feature.

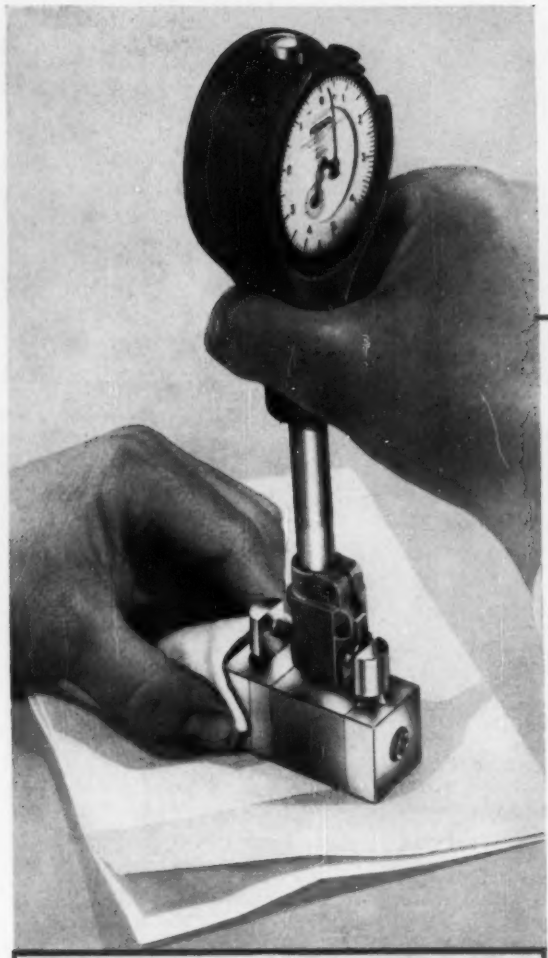
GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

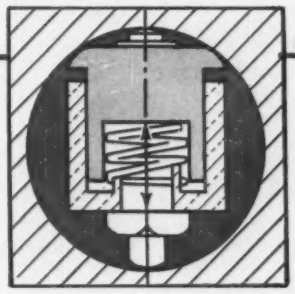
4852 East 282nd Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS



YOU SET IT DIRECTLY TO GAGE BLOCKS or with a micrometer . . .

Precise Centralization is Built-in



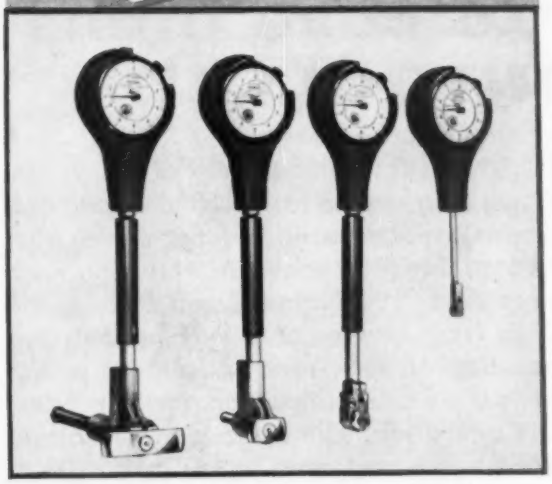
Positive centralization. Single plunger eliminates off-center location, assures precise alignment of centralizers and sensitive contact.

You can set this gage to gage blocks or micrometers with perfect assurance that when you place the gage in the hole the contacts will locate precisely on the true diameter.

Instead of using two separate centralizing plungers which might respond unequally to a common source of pressure, thereby making centralization inaccurate, the 1250 Series Bore Gages have a single, large, spherically radiused plunger which contacts the circumference of the hole at two points. The generous bearing surfaces assure precise movement of the plunger so that pressure is exerted equally at each point of contact, causing the gaging head to seat with greater accuracy on the true diameter of the hole.

At time of assembly, the sensitive and reference contacts of each gage are radiused precisely concentric with the plunger. This provides much greater accuracy than can be actually obtained by attempting to align a sensitive contact with two separate plungers. Even when the gage is unintentionally cocked laterally, it still holds its accurate centralization. Write for complete details.

FEDERAL PRODUCTS CORPORATION
6138 Eddy Street • Providence 1, R. I.



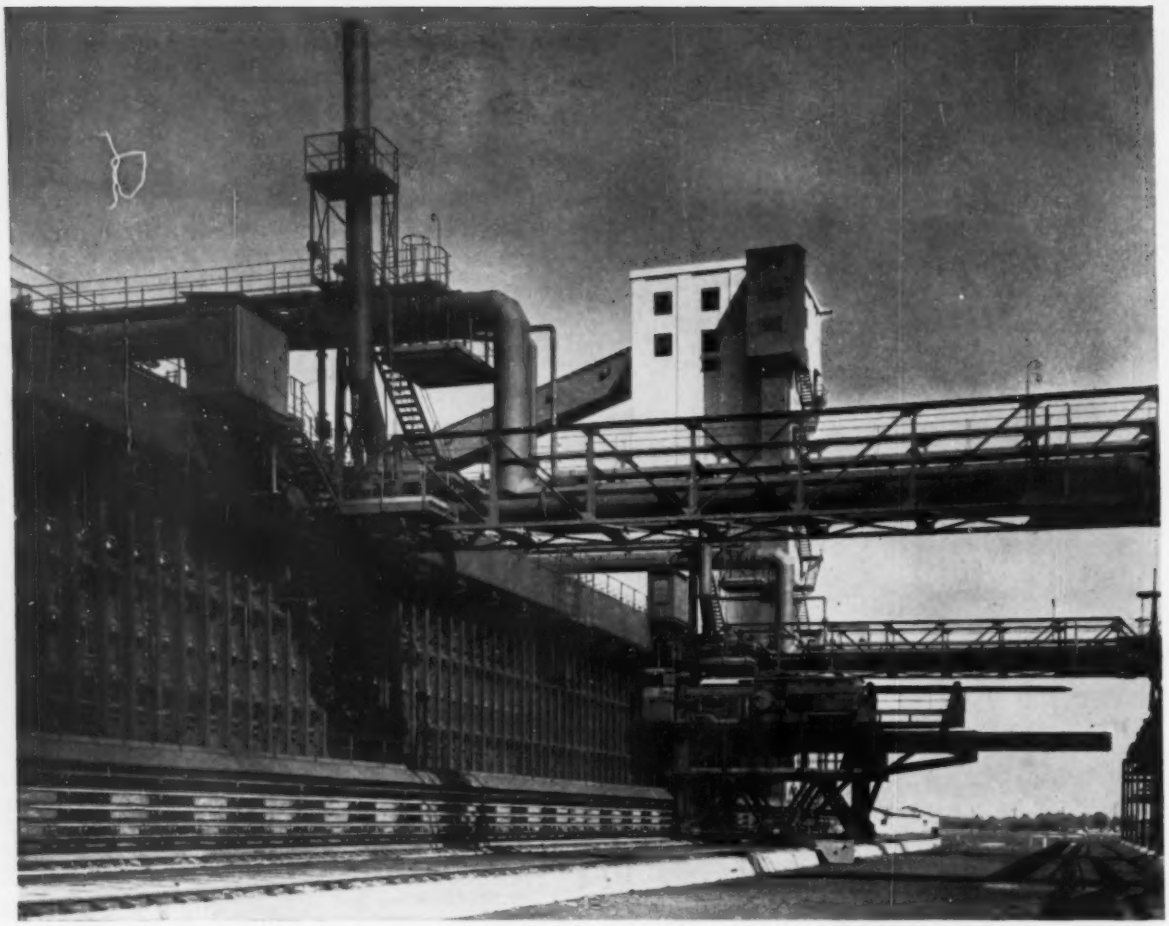
Four gages inspect all diameters from ½" to 8"

FEDERAL'S SOLUTION TO THE COST OF GAGING:
Impartial Gage Selection
Engineering Follow-Through
Everything in Gages

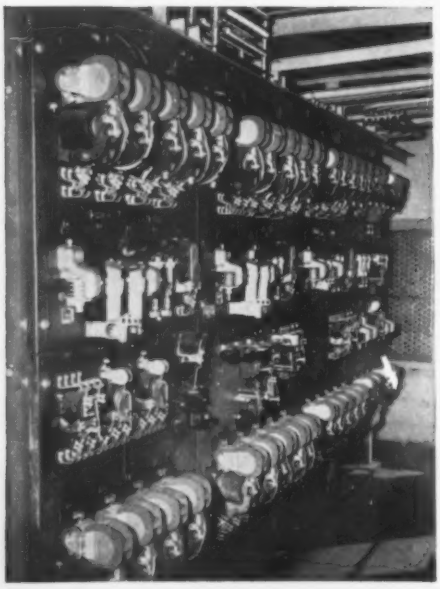
Ask **FEDERAL** *First*

FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic—for Inspecting, Measuring, Sorting, or Automation Gaging



Giant pusher for 76 coke ovens is CLARK CONTROLLED



Coke is discharged from this battery of 76 ovens—almost 300 feet long—at the rate of 58 tons per hour. The enormous Clark-controlled pusher moves from oven to oven on a regular schedule, emptying each as it becomes ready . . . Designed and built by the Wilputte Coke Oven Division of Allied Chemical and Dye Corporation of New York, the 300,000 pound pusher depends on Clark apparatus for its precise, dependable operation. The six separate motors, totalling 175 HP, are controlled by a Clark Bulletin 9300 Coke Pusher Control. The special Clark Control Panel is shown at the left.

The CLARK CONTROLLER *Company*

Engineered Electrical Control

1146 East 152nd Street • • Cleveland 10, Ohio

IN CANADA . . . CANADIAN CONTROLLERS, LIMITED • MAIN OFFICES AND PLANT, TORONTO

TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

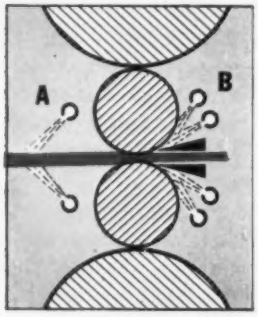
Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

Choosing work rolls for hot strip finishing trains

In continuous hot strip mill operation, the highest frequency of time-consuming roll changes usually occurs in the early stands of the finishing train. Conditions here are severe: the reductions taken are heavy, and the strip is still thick enough to carry much of its original heat.

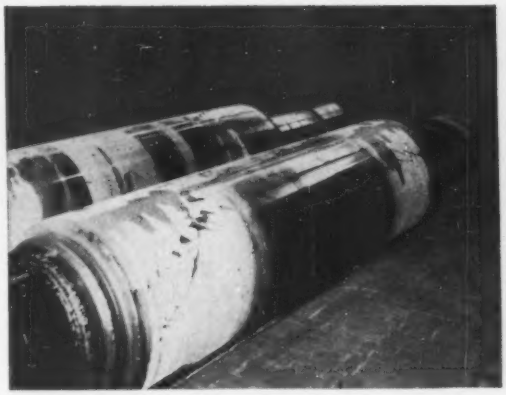
Water: the secret of longer roll life—Banding is a chief cause of premature roll failure in these stands. This peculiar tendency is related to the amount and size of graphite in a roll's surface, and to the adequacy of the cooling system. At high temperatures, graphite tends to pull out of the surface, leaving tiny fissures. Rolling pressure then forces in small particles of scale. These offer footholds for further scale build-ups, which are rapidly rolled into elongated bands.

Thus, cooling is vital. Water should be applied at a pressure of 140-to-200 psi, and in such a way that a large volume actually reaches the roll surface. The nozzle arrangement should be designed to create uniform cooling over the entire work surface. In some cases, additional sprays on the pass line are necessary.



EFFECTIVE WATER APPLICATION includes high-pressure sprays (A) aimed against the strip to push the scale out of the rolls and high-pressure water (B) in large quantities applied to the roll surfaces as close to the point of contact with the strip as the mill design permits.

Choice of rolls can make or break a rolling schedule—Where it is impractical to cool the rolls thoroughly, it is still quite possible to minimize roll changing by using Mack-Hemp *Midland Superalloy* rolls. These are nickel-chromium-molybdenum alloy steel rolls containing no graphite and capable of being heat treated to high hardness levels. As a result, they are extremely resistant to spalling and fire cracking, affording no foothold for scale.



ROLL BANDING on hot strip mill work rolls is a principal cause of uneven gage across the width of the strip. It brought about the early removal of this pair of rolls.

Where rolls can be adequately cooled, *Mack-Hemp Nironite "F"* double-poured high-nickel grain rolls actually will roll greater tonnages than alloy steel rolls. The indefinite chill of the first pour keeps the graphitic content of the iron low near the roll surface, while the second pour produces a strong, ductile core.

For less severe conditions, the *Mack-Hemp Nironite A or B* grades of grain roll give an excellent account of themselves. Although they show more graphite near the surface, they frequently turn in surprising tonnages between roll changes.

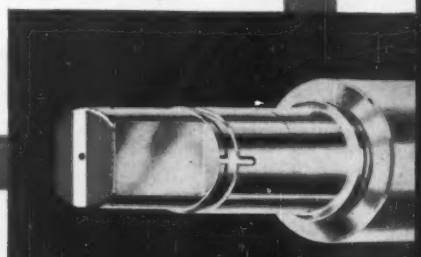
Mack-Hemp is as interested as you are in securing maximum output from your mills. If there are troublesome "roll-wreckers" among them, why not call upon us for help in selecting rolls to beat your special problems? There's no obligation. Write us today.

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

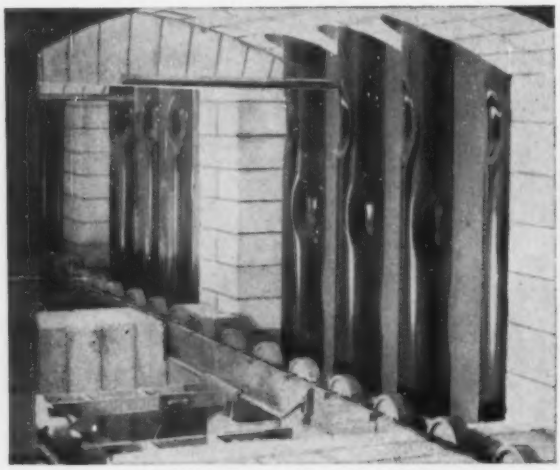
Division of E. W. BLISS COMPANY

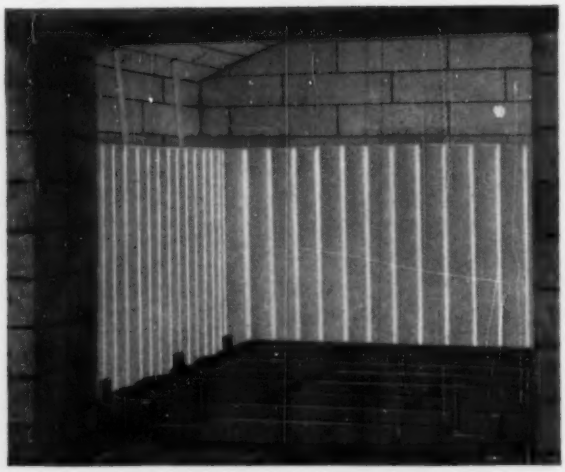
Presses, Rolling Mills, Special Machinery



Whatever your source of heat...

LINDBERG HEAT TREATING FURNACES OFFER THESE EXCLUSIVE ADVANTAGES





. . . IN THE GAS-FIRED FURNACE

NEW LINDBERG VERTICAL RADIANT TUBE

Because of its revolutionary design, this tube provides a new level of gas-fired furnace performance. The secret lies in the new Lindberg tube's "dimples." The tube carries a central stream of mixed air-and-gas surrounded by a cylindrical stream of air alone. Combustion occurs in the area between these two streams. The "dimples" create eddies accelerating combustion and maintaining even temperatures along the entire tube.

This Lindberg tube will operate at maximum efficiency for a longer period of time. The special protective coating gives greatest possible resistance to carbon penetration. Vertical position eliminates soot deposit and resultant temperature increases at points of sooting.

Tubes are 59 inches long, weigh only 29 pounds, changeable in a few minutes. No costly furnace shutdowns nor high labor and material cost for tube changes.

. . . IN THE ELECTRIC FURNACE

NEW LINDBERG CORRTHERM ELEMENT

CORRTHERM, Lindberg's radically advanced new electric heating element offers advantages never before available for heat treating furnaces. With this new element carburizing and carbonitriding with electricity becomes practical, efficient and economical. Ideal, too, in other types of Lindberg electric furnaces.

The outstanding feature of the CORRTHERM element is the extremely low voltage at which it operates. Consequently, leakage through carbon saturation and shock or short hazards are eliminated. Elements also act as baffles to direct circulation of convection streams.

CORRTHERM elements are practically indestructible. Work load or operator's charging tool can't hurt them. Watts density is at all time low. Easily installed or replaced, too, as element merely hangs in furnace and no complicated mountings are required.

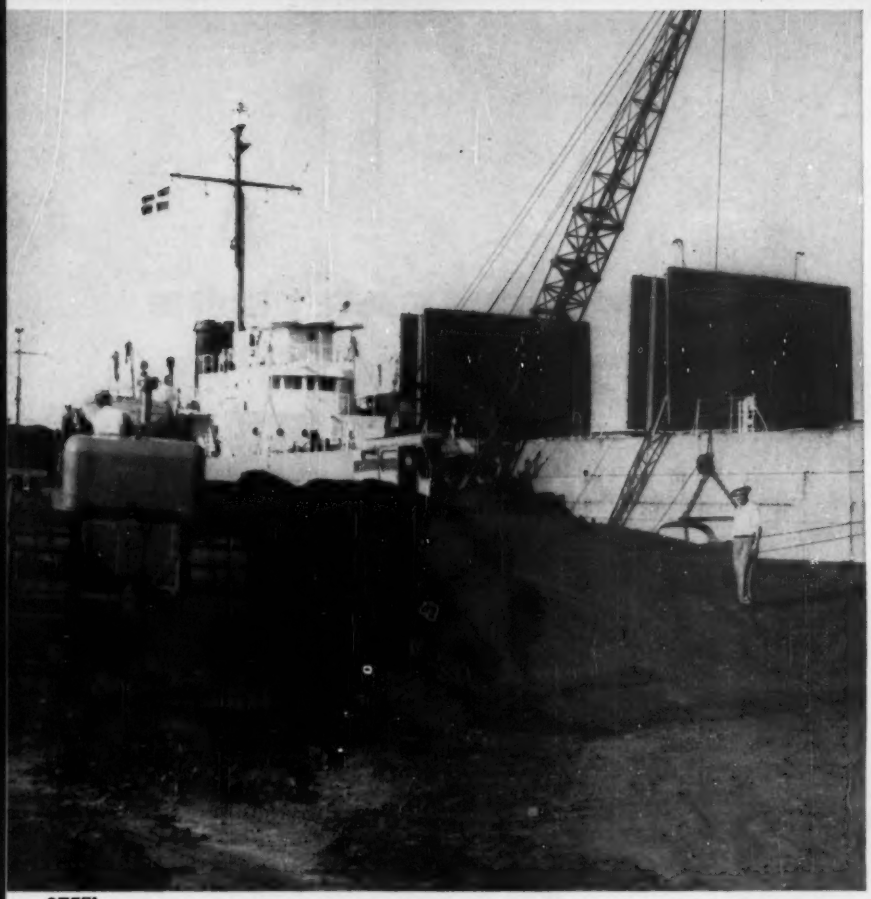
Lindberg Field representatives in 21 cities are ready to show you how Lindberg furnaces with these revolutionary new elements can improve your heat treating process. You'll find your Lindberg representative's name in the classified section of the phone book or write us direct.

LINDBERG FURNACES

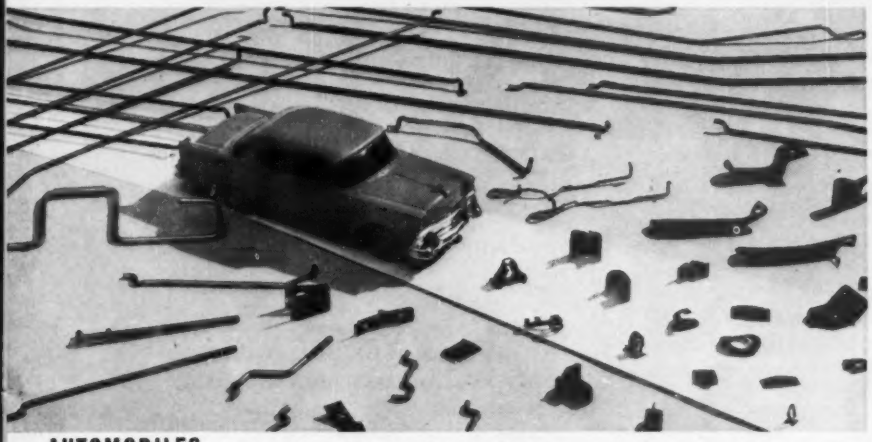
LINDBERG ENGINEERING COMPANY

2452 W. Hubbard Street • Chicago 12, Illinois

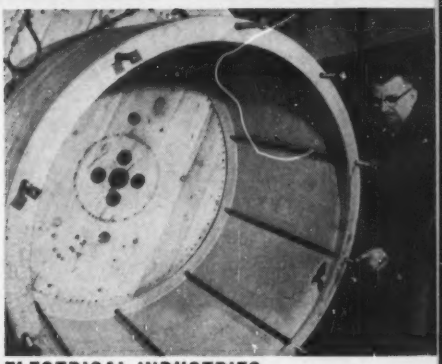
BARIUM STEEL—active in America's growth



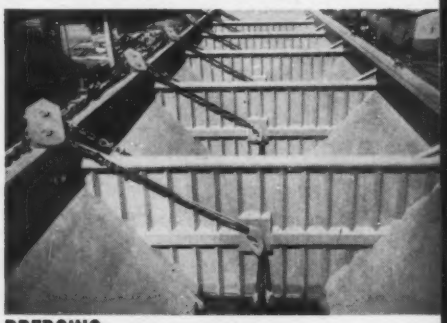
STEEL. Rich iron ore from mines in the Dominican Republic is being loaded onto Barium ore carriers here for import. Averaging between 65% and 69% iron, this high-grade ore will go to service Barium's steel-making facilities, as well as adding to the industry's supply of open hearth lump ore.



AUTOMOBILES. Some of the body parts for practically 4 out of every 5 American cars today come from Barium's Cuyahoga Spring Company. In addition to these oddly shaped rods and automotive parts Cuyahoga also specializes in springs and flat fasteners for household appliances. Perhaps this specialized experience could help you.



ELECTRICAL INDUSTRIES are long-time Barium customers. Made at Bayonne Bolt Corp., these ¾" by 44½" long bolts are used by General Cable Corp. of Bayonne to assemble the large cable reels above. Washers on this job come from Phoenix Iron & Steel, another member of the Barium team. Whether you're looking for standard or special fasteners, you'll find them at Bayonne.



DREDGING and harbor transport experts are showing keen interest in this 170' hydraulically-controlled dump scow designed by Barium. Made by Barium's Wiley Manufacturing Co., this one goes to J. Rich Steers Sand and Gravel Corporation of New York, while three more are already on order. Maybe this new design could solve some of your dredging or harbor transport problems.

AIRCRAFT jet engine and guided missile manufacturers come to Industrial Forge and Steel for titanium billet forgings. This Barium subsidiary specializes in titanium and is one of the largest forgers of this new, light, strong, heat-resistant metal. If you're interested in a metal with these characteristics, why not check with Industrial.

63

STEEL PRODUCERS

Phoenix Iron & Steel Co. (Plate Div.; Structural Div.; Steel Tube Div.; Blast Furnace Div.)

STEEL FABRICATORS & PROCESSORS

Phoenix Bridge Company • Industrial Forge & Steel, Inc. • Globe Forge, Inc. • The Geometric Stamping Company

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FACTS

about

NEW DEPARTURE
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FOUNDATION OF OUTSTANDING QUALITY

● In manufacturing highly specialized precision products, such as New Departure ball bearings, there is no short cut to the knowledge and skill gained by long experience. The superiority of the methods, materials and the products resulting from New Departure's sixty years of manufacturing experience is recognized wherever precision ball bearings are used.

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NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN.

NEWSFRONT

And Now, The After-Effects

Delayed action effects of the steel strike are beginning to catch up with users of plates and structurals. One major producer of steel mill equipment, taking stock of the situation, expects to be hit in the face by shortages within a month. Same company has been casting around for foreign steel, but has had little luck thus far in finding the right alloys.

Niobium Research Studies Launched

Expanding aircraft needs are bringing a push for metals capable of taking temperatures of more than 1000°C (1830°F). One result a GE-sponsored research program at Carnegie Tech on the metal, niobium. Very expensive, niobium has a melting point of 2400°C. But in practice its low oxidation resistance limits its usefulness to about 1200°C. Nitrogen, hydrogen effects on pure niobium will be studied.

Aluminum's Gaining Ground

Aluminum is widening its automotive markets. Latest reports make it seem quite certain that one of the big three will definitely go ahead with production of extruded aluminum door frames for its 1958 models. Still a ways off—but already-worked-out resistance flash welding techniques will include means for leaving clean smooth joints without fuss.

Six-Cylinder: Still Well-Liked

Despite emphasis on the V-8 engine's added zip, a surprising number of new car buyers still favor the six. Majority of the smaller engines find markets along the Atlantic seaboard. In New York, for example, sixes account for over 25 pct of the annual total of cars sold. Economy of operation is one big factor.

With Vacuum Furnaces, Three's A Crowd

With a 30-ton vacuum furnace already in operation in an Eastern plant, one major steelmaker expects to have two new vacuum degassing furnaces percolating before year's end. The production-sized units boast 250-ton ladles plus television cameras within the vacuum chamber. Of the Bochumer Verein type, the furnaces take molten metal from the open-hearth and stream-droplet-degas it to low levels.

Make Room For Missiles

Metal requirements for standard artillery pieces and for shell production are falling off, while demand for guided missile materials climbs precipitously. Longer-range guided missiles, easily moved and quickly launched, are replacing much of Army's cumbersome artillery. Missile buying this fiscal year will cost $300 million—six times amount for artillery.

New Tantalum-Columbium Recovery Method

Bureau-of-Mines developed, a new method recovers tantalum and columbium economically from low-grade ores, concentrates or smelter slags. Tantalum and columbium occur together, have always presented separation problems because they're so chemically alike. The new solvent-extraction technique is reported entirely feasible for industrial use.

New Fast-Writeoff Angle?

Defense Mobilization Board officials aren't buying arguments that expansion goals for structurals, heavy plate and tubing should be reopened, permitting fast amortization, because move might stem further steel price increases. Board considers reopening question in about a week; intends resolving issue on defense considerations alone.

Specification Buying's Not For Lubricants

Is chemical specification buying good practice in purchasing machine tool lubricants? One expert thinks No, says such specs aren't complete, fail to determine performance. Buyers would do better, he suggests, to leave chemical considerations to lubricant manufacturers; set up, and ride with, performance specs instead.

Iron ore plant protects 2,000 bearings on crushers and pan feeders with Farval

FARVAL—
Studies in Centralized Lubrication
No. 195

KEYS TO ADEQUATE LUBRICATION—

Wherever you can see these Farval manifolds, dual lubricant lines and central pumping station, you know a machine is being properly lubricated.

Above—four pan feeders and their screens at the Sherman Crushing Plant. Below—close-up of Farval valves serving a feeder.

CRUSHING and handling iron ore creates extreme pressures on processing equipment; so proper lubrication is vital to prevent overheated, ruined bearings, with consequent work stoppage, lost production and needless maintenance expense.

To ensure dependable, adequate lubrication of their equipment, Oliver Iron Mining's Sherman Crushing Plant at Hibbing, Minnesota, installed Farval Centralized Lubrication. A total of 2,000 bearings on crushers, pan feeders and screens are served from two Farval automatic pumping stations.

By protecting equipment, Farval saves labor—helps to maintain production schedules. With Farval on the job, oilers are kept out of the dangerous machine areas—a safety factor. Lubricant lines reach bearings even in the most inaccessible places to apply oil or grease in measured quantities as frequently as desired.

Farval can serve any machinery builder or owner—efficiently, economically, permanently. For details, write for Bulletin 26-R. The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

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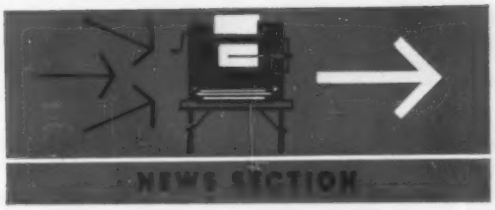


Why Scrap Prices Hit The Ceiling

Basic laws of supply and demand dictate high prices . . . But many other factors contribute . . . Ore scare helps keep price high, exporting increases . . . Strike had an important effect on industry policies.

◆ STEEL MILL scrap buyers are grudgingly making purchases of scrap at record high prices. What's more, there is little possibility of a significant drop in the near future.

Volatile scrap prices have been climbing in irregular steps for decades, from the depression low of $7.54 in 1933 (IRON AGE Composite average) to the latest high of over $57.00 today. The forces that brought about the new level aren't the kind that will dissipate in a few days.

Many Factors

What's behind the new record high of scrap prices? Some of the factors are more or less routine, connected with the fundamentals of low supplies and a high demand. Others are more complex and originate far from U. S. steel mills.

Basically, following the steel strike, mills will operate at near capacity for the remainder of this year and probably well into 1957. This alone assures a relatively high level of scrap prices.

Unprecedented Rises

This situation is aggravated by the fact that mills let their inventories dwindle before the June 30 steel labor deadline, then had to come into the market with a vengeance even before the strike ended.

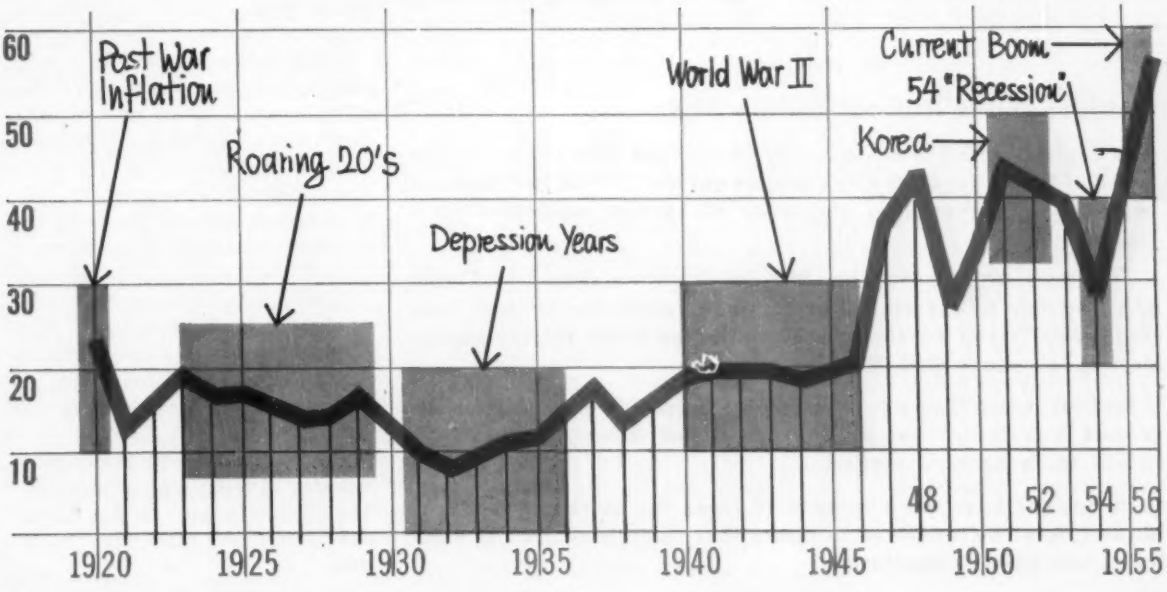
Scrap prices actually climbed during the strike, an unprecedented market situation. Furthermore, no buildup of scrap in dealer yards or of laid down scrap materialized to any great degree, another unprecedented situation. Mills that operated during the strike were unable to maintain their inventory levels as scrap collections continued low.

Just where the scrap went is somewhat of a mystery, but not entirely. Cutbacks in automotive output cut into generation of scrap for the highly prized auto lists. It's generally estimated that 13 pct of all steel shipped to the auto industry returns as scrap. With auto production severely cur-

Iron Age Composite Price

Scrap Prices — Boom or Bust

1956 — August 14.



tailed, scrap from the auto industry faded in proportion.

Faced with the prospect of a steel strike, dealers had no incentive to pile scrap in their yards. Many timed their vacations with the labor deadline. Tendency to plant-wide vacations cut into industry scrap production everywhere, setting the stage for a midsummer scrap shortage.

Historically, scrap prices have broken sharply upward at the close of steel labor negotiations, even when no strike occurs. The pattern is obvious. Mills hesitate to go into a strike zone with excessive inventories, and frequently labor negotiations are followed by an upturn in steel production.

Little Hot Metal

Another strike factor is the delay in resuming full blast furnace operations following a shutdown. First steelmaking operations as production resumes rely on a charge heavy with scrap because of the low supply, even complete unavailability, of hot metal.

As a case in point, Tennessee Coal & Iron Div., U. S. Steel Corp., announced shutdown of a blast furnace at its Ensley, Ala., plant due to a break-out caused by the prolonged railroader-steel worker strike at the plant.

J. W. Kinnear, vice president-operations, said the break-out occurred Saturday as the furnace was being brought into blast. Furnace has a daily capacity of 1100 tons of iron.

Similar problems will be encountered by other producers in the months ahead. The strain of reducing furnace temperatures and bringing them back up again will put furnaces out of action prematurely, particularly those units that were nearing the end of their normal campaigns. Some furnaces never went back into production after the strike ended.

Export has been a big force in keeping scrap prices high. World-wide steel production is at capacity and foreign scrap is scarce. The give-and-take between Commerce and State Depts. over whether or not to control scrap exports has gone on for over a year. (IRON AGE, April 26, 1956, P. 57.)

But until recently, most interest in scrap exports has been directed at Europe. This situation is now changed. Japan's revived shipbuilding industry has passed Germany in output, now is second in the world. Its yards need steel plates.

Japan Goes to East

For a time, Japan's inroads on U. S. scrap were confined to the West Coast, then ventured to the Gulf Coast. But now Japan is reaching all the way to Boston, is buying heavily of unstripped motor blocks, a highly desirable commodity for Japan since many of the attachments are nonferrous, help solve the nation's nonferrous shortage as well.

And recently a new scare entered the picture, contributing to higher prices. That is a possible ore shortage, brought about by shipping lost during the steel strike and a subsequent maritime strike of the fleet of Pittsburgh Steamship Div. of U. S. Steel. Idleness of the 58-boat fleet cut deeply into the ore movement, already hit by the strike.

It is probably doubtful if any real ore shortage is threatened. But the bare possibility has a strong effect on the highly sensitive scrap market.

How Long?

How long will prices stay at their current level? It is difficult to tell since some of the price blame must be attributed to artificial factors of speculation, which can disappear over night.

It's always possible but doubtful that scrap export controls could be tightened. It is a fact that when the heat is on to tighten controls, scrap prices will mysteriously drop a few degrees.

But in general, supply and demand control the basic level of scrap prices in the long run. It will require a change in the basic market to produce significant price declines. Some of these may materialize.

For one thing, 1957 model production will add new life to generation of auto scrap, with fat auto scrap lists in prospect for September, October, November and on into the winter. In addition, railroad car scrapping will increase sharply in the next few months as car builders get steel to build new cars for replacement.

Blast furnace operation will again reach the maximum. The steel industry is also making strides in processes requiring little or no scrap, admittedly a very long term solution.

As it stands, scrap prices may not stay at today's peak level, but they do not appear to be in for any significant drop for some time.

Dealers Make Killing, British Style

▪ In England, scrap prices can only be changed with consent of the Board of Trade. But some scrap dealers got word of the last increase before it was announced and made the British equivalent of a "killing."

The very proper Mr. Low, Minister of State, Board of Trade, admitted this in the House of Commons where he alleged "less responsible" scrap merchants had profited by about 100,000 pounds sterling, or about $280,000.

Said Mr. Low: "There is evidence the proposal to make some increases was known outside the actual individuals we consulted before the order was made.

"It has not been found possible to trace the source of the leak. In the future, we will have to insure that there is no leak if need be by limiting our consultation."

DIESELS: From Backdowns to Backlogs

Wide range of uses, light weight, fuel adaptability help upturn in diesel sales . . . Stationary power sales will be up 20 pct this year for record . . . Standby power provides new market—*By K. W. Bennett.*

◆ ITS ADAPTABILITY and versatility are reversing the downward trend of diesel engine production.

Already pushing up under the impetus of heavy advances in locomotive demand, truck use and construction equipment buying, diesel engines will also turn up a 20 pct increase this year in the stationary power field as well.

Strictly speaking, it's high time.

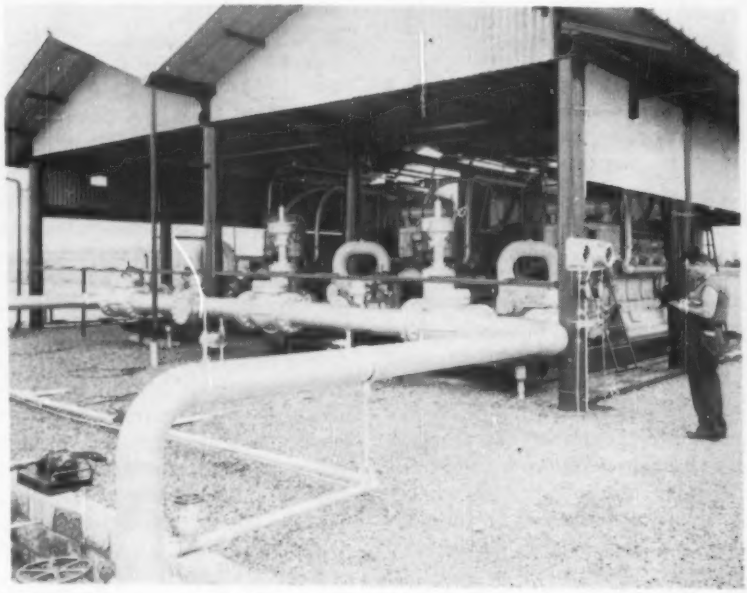
Available statistics indicate a drop in diesel production from 1951 through 1954. In 1951, the industry produced at least 129,203 diesel engines, in 1952 the figure slipped to 120,538; in 1953 it dropped again to 117,528, and in 1954, along with a major portion of U. S. industries, diesel producers suffered further cuts to a total of 104,686 units produced.

On the Upgrade

Some sources argue that 1955 was no better than 1954, there's good evidence that the 1955 total advanced to about 110,000 to 114,000 units built. In 1956, it is probable that the industry will produce a conservative minimum of 130,000 units, beating the 1951 peak.

What's behind the push? For one thing the diesel has demonstrated a chameleon-like adaptability to a variety of fuels. You choose the diesel type engine best adapted to local fuel costs. The dual-fuel diesel appeared about 1947, has grown to the point at which one company reports the majority of sales are in the dual-fuel unit. This warms up on diesel fuel, then switches to natural gas when at operating speed.

Fairbanks-Morse two years ago introduced a tri-fuel unit, a jet ignition gas-burning 2-cycle engine.



THREE is no crowd in this case. The three Caterpillar Diesel D 397 engines furnishing the power for oil pumping operations are typical of the stationary type diesels whose adaptability is spurring sales comeback.

The gas turbine is coming, but thus far is regarded as a little too far in the future to frighten diesel men badly. Meantime, diesel builders are adding to their own list of fuel possibilities.

Easy Handling

At the same time, the engine frame itself has been receiving considerable attention. Though portability in a diesel is more important in mobile than stationary power plants, the easy handling of heavy - duty, light - weight diesels has pushed their acceptance even in stationary uses.

Thrust in the gain in stationary diesel use is tied, among other things, to the growth of air-conditioning. Smaller municipalities, faced by record summer load peaks as the perspiring public steps up their air-conditioning use, are augmenting local power supplies with diesel generating units.

At the same time, industry has finally bought the idea that standby electrical power plants pay their keep. If the municipal power fails, the plant goes on to its own power.

And also, export oil drilling and offshore drilling have been going great guns. Both operations require power units that can be transported, can carry their fuel with them.

The diesel of today is a far cry from the engine Rudolf Diesel brought into a troubled world when the century was in its teens. It can burn oil, gas, or both, or L-P gas, and it may even have an ignition system. All these it has, and more important, it has customer appeals.

Deliveries are still fairly current, depending on the producer.

CONSTRUCTION

CONCRETE: A Rival For Structurals

Shortage in structural steel is giving prestressed concrete fabricators a chance to get market foothold . . . It is competitive in price, speed of erection . . . Maintenance costs lower—*By R. O. Schulin.*

◆ THE NATION'S LAGGING construction programs are getting a shot in the arm from structural steel's newest competitor — prestressed concrete.

To the tune of millions of dollars annually, concrete fabricators are moving in to take up the slack caused by the shortage in structural steel. Prestressed concrete, untried in this country until 1950, is the concrete industry's best challenge to steel so far.

In the U. S. today, there are more than 5,000 precast concrete plants compared to just a few hundred 10 years ago. Most are equipped for prestressing production and, under special conditions, many will do job-site precasting. The list of concrete buildings and bridges going up grows daily.

But veteran concrete fabricators aren't kidding themselves about their ability to compete with steel.

Compete in Price

"We cannot beat steel price-wise, but we are competitive," states Paul W. Gleason, sales manager of Formigli Corp., fabricators of precast concrete products for 40 years.

"There has been a tremendous influx into the industry by people drawing improper conclusions by the temporary shortage in steel," he continues. "They are blinded by current market conditions to the real investment required in this business under normal conditions."

Even prestressed concrete manufacturers aren't entirely free from steel prices. An 8 pct increase in the cost of steel reflects a 2 pct increase for prestressed concrete, Gleason says.

How It Works

In fabricating prestressed members, steel wire reinforcement is drawn taut inside the member, utilizing the elastic characteristics of steel wire to take care of shrinkage and plastic flow of concrete. It permits the concrete to take high tension loads without cracking and avoids the old bugaboo, cracking due to temperature changes.

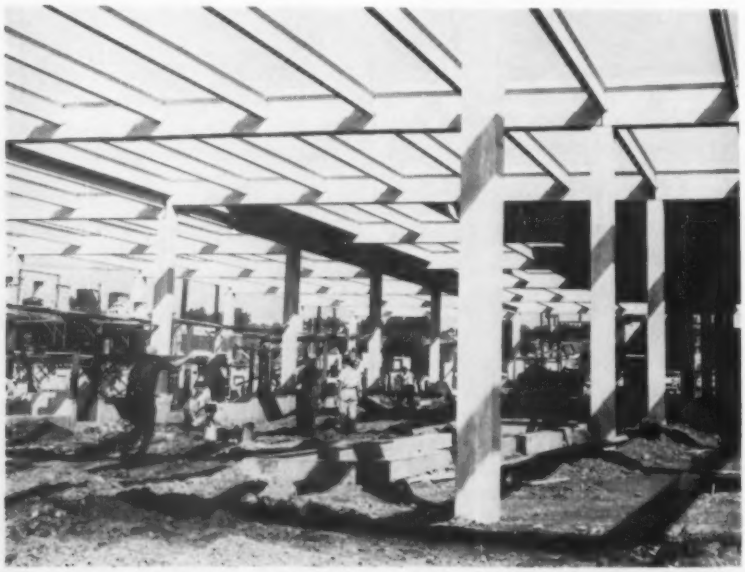
Two inherent advantages of concrete construction are low maintenance costs—no painting is required—and low fire insurance rates. Erection time compares favorably to that of steel. A precast concrete building can be put up at a rate of 8000 to 10,000 sq ft per day. But the availability of concrete is the thing that is making it more attractive to builders —many of whom have to wait 14 to 18 months for steel deliveries.

A major drawback of prestressed concrete has been the lack of design specifications. Because it is a new structural medium, this is to be expected. Engineers are unacquainted with the material.

Needs Education

"Most engineers are more familiar with steel," says Raymond A. Hood, of Keast & Hood, Philadelphia consulting engineers. "Invariably, design engineers draw their specifications for steel. Anyone wanting to make an alternate bid for a concrete structure must add designing costs."

However, the industry is working on the problem of design specifications and several types of members already have been ac-



SHAPES ARE FAMILIAR but this framework is made of a relatively new structural medium—prestressed concrete. When completed, it will be a terminal for Philadelphia Transportation Co. The builder is Formigli Corp.

cepted as standard by engineers and architects.

The cost of 12 prestressed concrete bridges, fabricated by Formigili Corp. for New Jersey's Garden State Parkway, averaged $9 per sq ft with deck and handrail in place. Cost of beams averaged slightly over $5 per sq ft of deck. The spans varied from 39 to 60 ft.

The precasting technique enabled bridges to be built over heavily traveled roads without detouring traffic.

Low Bids

Although concrete men consider their product competitive with steel, there are many instances where prestressed concrete designs have underbid steel by considerable margins.

A $348,500 bid for a concrete high school gymnasium at Greensboro, N. C., was $10,000 lower than the lowest steel bid submitted. The per sq ft cost of the gym was estimated at $8.50.

Bids on final designs for a bridge on the Kenai River Highway in Alaska indicated that a saving of $100,000 was obtained on an alternate concrete design compared to the original steel truss design.

More Savings

In Philadelphia, city engineers faced with a 14-month delay in steel deliveries for a $1 million bridge, sent out specifications for an alternate concrete design. Bids returned were 20 pct lower. Now city officials are seriously considering switching two other proposed bridges to concrete design.

A 25,000 sq ft prestressed concrete warehouse recently built in the southwest cost less than $4 per sq ft. The structural frame was built for about $1.25 per sq ft, including the columns. The owners expect to realize a $24,000 saving in insurance rates over the next 20 years.

Whether concrete can withstand competition from steel once the supply of structural steel catches up with demand is a moot question. But significant strides are being made with the new medium, and men in the concrete industry see continued strong growth in the future.

CONSTRUCTION

STAINLESS: Bright to Black

Ebonized steel is new name for black stainless . . . It was developed in World War II for military use . . . Will make its first appearance on New Madison Ave. building.

An old veteran of World War II, blackened stainless steel sheet, is being recalled to service by Armco Steel Co.

Now called ebonized steel, it will be used for curtain wall building construction. The first major order for the sheet has been received for a New York Madison Ave. building. It is also being considered in preliminary planning in black-and-white vertical stripe design.

The patented ebonizing process developed by Armco has been made available on a royalty-free basis to fabricators. First order was for 40,000 lineal feet of strip for the new Commercial Investment Trust Co. building on Madison Ave. at 59th St. This eight-story building will have black vertical stripes about 2½ in. wide in contrast with conventional bright stainless.

War Baby

Blackened steel was developed during World War II by Armco when the Army needed a rifle steel that was corrosion resistant but still would not reflect light. Blackened steel gas chambers for Garand rifles were turned out by the thousands.

There was little demand for the product in peace time and the product and process went into retirement. It showed one short quiver of life in 1948 when a stove manufacturer used it under burners.

Increasing use of stainless steel curtain wall construction on jobs such as the Socony-Mobil building has revived the product for use as trim and a major revival may be in the wind. (Total tonnage of stainless in construction this year is expected to hit 23,000 tons, up six pct from last year.)

The blackened process is relatively simple. Conventional stainless with a satin finish is immersed in a sodium di-chromate bath at 750°F for half an hour. This deposits a smooth dull black oxidized film about 0.00001 in. thick.

Thin Film

Sample pieces have been exposed to the weather for 10 years with no fading or corrosion. It will also withstand salt spray successfully, but the color can be removed by abrasion. Colors other than black have been obtained by Armco researchers by juggling other di-chromates. Strong colors have not been developed so far, but the process is promising.

Other major markets in sight are for auto trim, wheel guards, kitchen and appliance molding strips, marine use, photographic darkroom equipment, movie projectors and military equipment.

Colored Porcelain Sheets

Armco is also the first company to begin promotion of colored porcelain enamel on stainless steel. This combines color with the brightness of natural stainless. The new surfaces stem from a study at Princeton University last year sponsored by the Stainless Steel Producers Committee of the American Iron & Steel Institute. Subsequent research by Armco has made it the first producer to offer this innovation.

In the porcelain enameling process, patterned sheet of stainless is either sprayed or dipped in the enamel, with enamel being removed in selected areas. The panel is then fired at 1000°F and the heat tint removed from the unenameled area by electropolishing.

CHEMICALS: Mills Build Refining Plants

J&L and U.S. Steel announce million dollar plants to refine light oils from coke ovens . . . It's big market with benzene output up from 30 to 300 million gallons . . . Competition is petroleum.

◆ GROWING importance of coal chemical production in the steel industry was shown by recent Pittsburgh moves. In rapid succession came announcements that two major mills will build million dollar plants for refining the light oils recovered from coke ovens.

Jones & Laughlin Steel Corp. will spend $2 million for new facilities at Aliquippa, Pa. Its plant will employ modern refining techniques, yield highly purified benzene, toluene and xylene.

United States Steel Corp. is putting in a similar installation at its Clairton, Pa., works. U. S. Steel is not saying how much its new plant will cost but since Clairton has the world's biggest coke-making operation, a whopping outlay is indicated.

Behind this sudden activity are a number of factors. For one thing, the market for coal chemical products is in a state of explosive growth. Benzene, toluene and xylene go into things like nylon stockings, plastic toys, synthetic detergents and insecticides. Increased demand in these markets has skyrocketed production of benzene from 30 million gallons in 1938 to a current annual rate of over 300 million gallons.

What's Behind It?

But industries using the coal chemicals are steadily upgrading their requirements. Today, benzene containing more than one part per million sulfur is no good for making synthetic fibers and certain other products.

Petroleum Threatens

This has created a threat to steelmakers from the petroleum industry. Prior to the war, nearly all benzene, toluene and xylene came from coal, most of which was the coking type used in steel mills. During World War II, a supply pinch developed and petroleum manufacturers entered the field. Their share of the market has increased until today they produce one-third of the U. S. benzene output.

The steel mills have been purifying light oils by means of an acid wash. This gives a product that is still satisfactory for most applications. But the trend is toward greater purity and oil companies, because of their late entry into the field, are equipped with relatively modern refining plants.

Getting Sulphur Out

J&L's sulphur removal process is called "Hydrofining." It is being installed under a license to J&L from Esso Research & Engineering Co. Prime contractor is Badger Manufacturing Co., Cambridge, Mass. which has had a big hand in working out application details. Paraffin removal at J&L will be accomplished by a "Udex Process," which is being built under a license from Universal Oil Products Co., Construction is due to start this month for completion early in 1957.

U. S. Steel's new sulphur removal process will be built by Koppers Co., Inc. It is a pressure catalytic refining method and will be operated by U. S. Steel under rights obtained by Koppers from a German firm. Removal of paraffin will be by "Udex" process.

Koppers Builds USS Purification Plant

◆ CONTRACT to build U. S. Steel's multi-million dollar light oil purification plant at the Clairton, Pa., Works has been awarded to the Koppers Co., Inc.

The plant, employing a new process for the production of super-refined benzene, toluene and xylene, is expected to be completed by late 1957.

Chemical processing will be done by U. S. Steel under rights acquired by Koppers from a German firm.

Previously purification of crude light oil—a chemical recovery product of the coke oven — has been accomplished by washing the oil with sulphuric acid and caustic. Use of the new pressure catalytic refining process is cited as virtually eliminating all of the impurities contained in the three chemicals recovered in coking processes. With the new plant in operation, the present acid sludge disposal problem is also eliminated.

Dr. W. C. Rueckel, vice president and general manager of Koppers Engineering and Construction Div., says that the processes will make benzene, toluene, and xylene aromatic fraction purities equal to those being produced by any other companies in the U. S.

Benzene, which is the largest constituent in light oil, will be produced under this new process with a sulphur compound content of less than one part per million. By subsequent removal of paraffins a high solidification point may be readily attained.

CONTROLS: Going For $1 Billion Jackpot

It looks like the electrical control industry will register over $1 billion in sales in 1956 . . . Will be its second entrance into the select circle . . . Report much product development.

◆ ELECTRICAL control industry is hard after its second billion. Industry shipments entered the select billion dollar circle in 1954. They promise to jump 25 pct over that figure this year.

Official confirmation of the boom comes from the 1954 Census of Manufacturers. Recently published advance report on the electrical control apparatus industry (S.I.C. Code 3616) shows that value of shipments roughly doubled between 1947 and 1954. The classification includes control devices used in the distribution as well as the end use of current.

Value of industry shipments increased from $579.1 million in 1947 to approximately $1.1 billion in 1954. It's estimated that shipments this year will approximate $1.250 billion, although in terms of constant 1947 dollars this represents a slight decline from 1954.

Establishments increased from 321 in '47 to 451 in '54. Number of employees jumped from 67,500 to 79,300; production workers increased from 49,700 to 56,200.

Trend

The Census report reveals impressive growth in the industry.

For example, shipments of electrical controls (not counting welding) increased from about $7 million in 1947 to $14 million in 1954. This is in line with the overall growth rate but just a foretaste of things to come as electronic automation develops in industry.

Control producers say that electronic tubes were not rugged enough for many production jobs. They feel this problem has been licked through the development of transistors and magnetic amplifiers. They look for static control (no moving parts) to come into its own over the next 10 years.

In the whole field of industrial automation, gains have been impressive. Shipments of electrical control equipment (excluding railway, motor vehicle) came to over $330 million in 1954 as against $170 million in 1947.

Outside Automation

Materials handling controls, along with brake and mill controls, emerge as a new $24 million category in the 1954 report. The increasing importance of control centers as a replacement for individual machine controls is indicated by their appearance as part of a new $45 million classification.

But more than two-thirds of the control apparatus items fall outside the range of industrial automation. Nearly $700 million of the 1954 shipments were accounted for by things like switches, circuit breakers, busways and relays. These devices are tied to general electrical consumption, which keeps doubling every 10 years.

Regarding geographical distribution, the Census shows that the electrical control industry is largely concentrated in New York, New Jersey, Pennsylvania, Ohio, Illinois, and Wisconsin.

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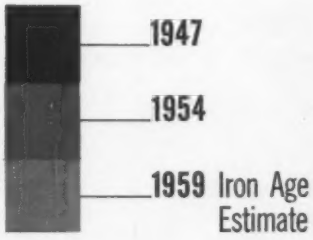
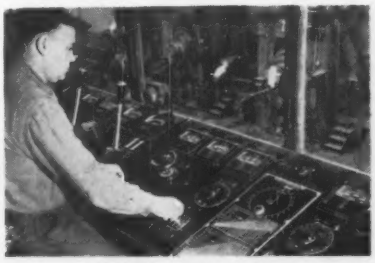
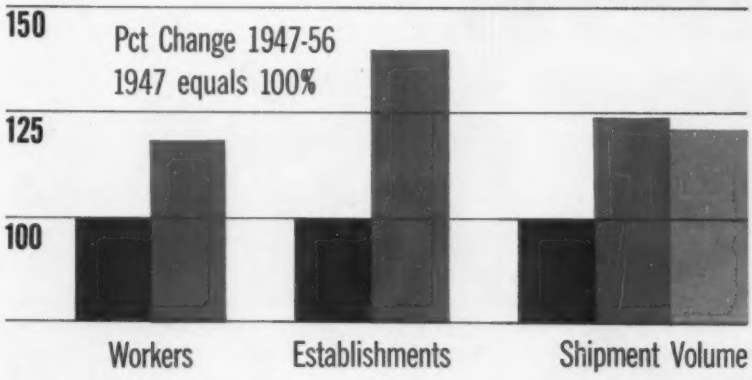
Over The Billion Barrier







Source: 1954 Census of Manufacturers.

Shipments in '47 dollars

PIPE: Farmers Take To Aluminum

They are finding it advantageous for on-the-surface irrigation systems . . . Biggest markets in arid West and Southwest, but usage is spreading back East . . . Sales 60 times greater than in 1946—*By G. J. McManus.*

◆ ALUMINUM irrigation pipe has caught on with farmers. Starting from scratch after the war, pipe makers doubled sales in one year, increased them four times the next and now have a volume just about 60 times greater than 1946 shipments.

What's happened is that there has been a new wave of farm irrigation and aluminum pipe has offered important advantages over other types of tubing. Its light weight (14 lb for a 20-ft length of 4-in. pipe) permits farmers to assemble and move lines in a hurry. Its controlled flow gives efficient water use.

On the Surface

For reasons of cost and corrosion, aluminum pipe is used mainly in surface systems. Irrigation layouts employing permanent underground lines provide a steady market for cast iron, steel cylinder, concrete and other soil pipes. Plastic pipe is attracting new interest today after getting off to a bad start because of quality variations.

The big boom, though, is in aluminum pipe. Aluminum Company of America, which pioneered the field, sells extruded pipe for general use, recently came out with a welded pipe for special corrosion situations. New pipe is clad inside and out with a corrosion resistant alloy.

In operation, large pipe lengths are strung along the ground from the water source to the field. Smaller lateral pipes run off the feed lines in different patterns. These are either perforated to provide a continuous spray or are equipped with rotating nozzles. A third method employs slotted pipes that run along the head of a field and allow water to seep down furrows.

Biggest market for irrigation pipe is probably in arid Western and Southwestern states. These had 28 million irrigated acres at last count. But states east of the Mississippi have more than tripled their irrigation since 1947. Thinking today is that irrigation pays off even in humid areas.

More Watering

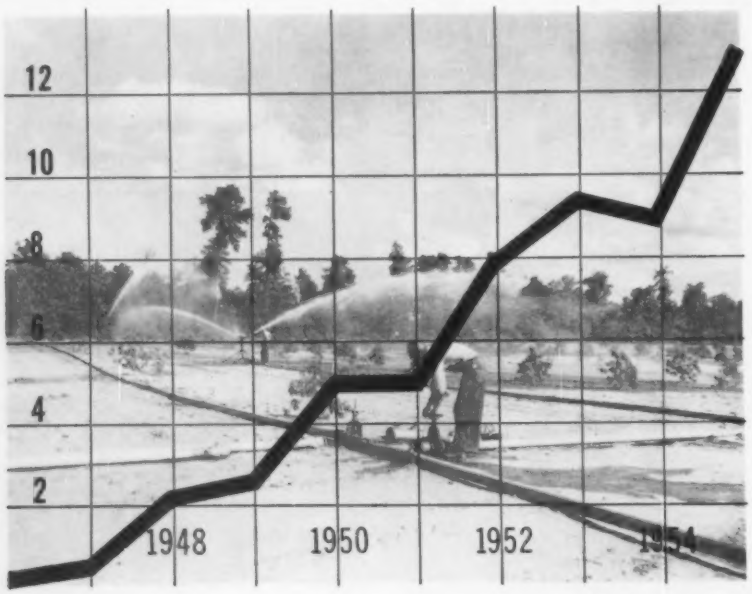
Reason for this is that most crops need more regular watering than rainfall provides. U. S. Agriculture Dept. says vegetables need one inch of moisture every 7-10 days for best growth. And today's farmers want that best growth Sixty-eight to eighty bushels used to be considered good for a Nebraska corn acre. Nebraskans now shoot for 125 bushels; they can be seen out watering fields in the middle of a light rain.

Same thing is happening on tobacco fields in the Southeast, potato farms on Long Island, on pasture lands, fruit orchards and truck farms in wet and dry areas. Farmers are irrigating to increase production rather than just to stay alive.

This drive for efficient production is accentuated by government control. A small farmer in Indiana can install a portable piping system for about the cost of twenty acres of new land. If he buys 20 acres, the government allows him to plant only half of it. He does better yieldwise and profitwise to put his money in pipe.

Irrigating With Aluminum Pipe

(ANNUAL SALES, thousands of miles)



Soil reclamation men say conventional irrigation could open up another 40 million farm acres and sprinkler irrigation could add 6 million acres. Pipe makers feel these figures may well be reversed.

They point out that pipe systems, with regulated flow, use only half the water of open ditches, which send water flooding over fields. And they see water conservation as a must in all sections.

It takes more than 27,000 gallons of water to spread one inch over an acre. With irrigation moving eastward, streams are being dried up and bickerings over water rights are increasing. At least one Eastern state is preparing legislation on the subject. More will follow.

Tax-Am:

U. S. Steel asks major rapid write-offs

U. S. Steel Corp. has applied to ODM for a certificate of necessity covering $81 million expansion and improvement at National Tube Division, McKeesport, Pa., and for $74 million expansion of pipe mills at Lorain, O.

New program is designed to increase National Tube's production of seamless oil country pipe. It will include a new blast furnace, openhearth and pipe making facilities at both Lorain and McKeesport.

U. S. Steel spokesman said detailed plans had not been developed, and that the program was still tentative, with the go-ahead hinging on ODM approval.

The move comes shortly after disclosure that Jones and Laughlin Steel Corp. had made a similar application to ODM for certificates of necessity covering a $250 million integrated pipe mill in Houston, Tex.

No decision has been made on the J and L application. However the shortage of oil country goods, particularly deep well casing, has been aggravated by the recent steel strike, and the Suez Canal dispute may require an increase in domestic oil production. Situation increases the pressure on the government to encourage expansion.

FINANCIAL

TAXES: Uncle Sam's Biggest Bite

Internal Revenue Service reports manufacturing firms paid record tax bill from record income in 1953 . . . Despite record, more and greater deficits were reported.

◆ MANUFACTURING corporations reported record income—and paid record taxes—in 1953, according to final tabulations recently issued by the Internal Revenue Service.

Primary metal industries rang up gross receipts of $23.4 billion, deducted $21.2 billion for various reasons, and registered net profits before taxes of $2.2 billion. Taxes, however, took $1.2 billion, so the firms wound up 1953 with profits of $943 million. They paid out $482.8 million in dividends.

All corporations — numbering 731,000 in 1953—reported net income of $39 billion, $1 billion higher than in 1952. Total tax liability was $20 billion, up 4 pct from 1952.

Not All Rosy

Except for agriculture, mining and quarrying, total receipts for corporations were higher in 1953 than in 1952. But despite this rise in gross income, construction, trade, and services suffered dips in profits. Despite the boom of 1953, the IRS says greater and more frequent deficits were reported by industrial firms than the previous year.

In the fabricated metals industry, according to IRS, sales amounted to $14 billion, and gross income from all sources $14.2 billion. After deductions of $13.2 billion, fabricating firms realized a gross profit of $1 billion, on which they paid taxes of $578 million. Of net profits of $456 millions, $212.6 million was paid in dividends.

Machinery industry registered a gross income of $23.5 billion; deducted $21.4 billion; paid $1.2 billion in taxes and wound up with net profit of $876 million, of which $437 million was paid out in dividends.

Electrical machinery and equipment industry had a gross income of $16.9 billion; deducted $15.3 billion; paid $957 million in taxes, and registered a net profit of $616 million, of which $347 million went out in dividends.

Millionaires Disappearing

The motor vehicle and equipment industry reported to the government gross income of $24.9 billion; deducted $22.3 billion, and paid $1.7 billion in taxes, winding up with a net profit of $974 million. This industry paid out $578 million in dividends.

The tax bite on personal incomes moved the total down in 1953. IRS reported 145 tax returns showing income of more than $1 million for the year. This was three fewer than in 1952 despite climbing business activity, and well short of the 219 recorded in 1950. The 145 million-plus taxpayers earned a total of $275.3 million in 1953, but paid taxes totaling $169.5, so kept an average of a little more than $72,000 each.

McKay Purchase

McKay Machine Co., Youngstown, O. has acquired Metal Processing Machine Co., Youngstown. Transaction was a stock trade, with the specific amount that changed hands not available.

Sales and engineering staffs of the two companies will be coordinated but not integrated. R. T. Klempay, former president of MPM will be general manager of the subsidiary, and a vice president of McKay. McKay declared that the move would permit it to offer a more complete line of equipment.

TRANSPORTATION

ENGINES: See How They Run

Stroboradiographs are X-ray pictures taken with newly developed General Electric equipment . . . Shoots through steel to "stop" moving parts of a running engine.

◆ IT IS GETTING so that nothing can hide from the probing eyes of the industry researcher. If his own eyes can't penetrate to the component he wants to examine he builds mechanical "eyes" that will.

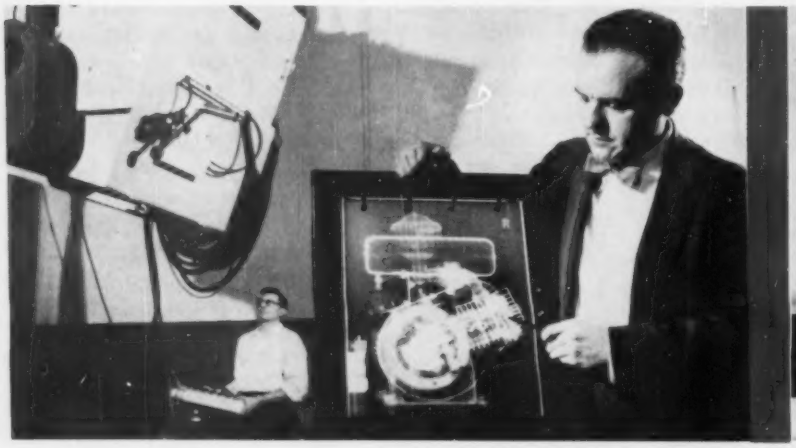
Latest development along this line is the special strobographic equipment engineered by General Electric technicians at the GE laboratory, Schenectady, N. Y., in cooperation with the Arsenal.

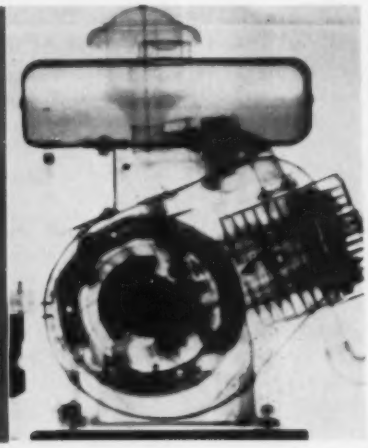
Powered by a 15 million volt betatron, mechanical eyes will ignore the engine block and cylinder walls of a running engine to record the actions of the internal moving parts in form of an X-ray photo. For experimental purposes a 2-horsepower, 4 cycle engine was used. Now for the first time engineers can study the efficiency and spot flaws in an engine without extensive road testing. Complete story is on page 120.

Above: A technician swings the betatron into position to take a stroboradiograph on the test engine.

Below Left: Detroit Arsenal engineer R. Dunec studies one of the first X-rays through steel photographs.

Below Right: A running engine has no more secrets as illustrated by this pioneer X-ray picture.





Truck Trailers:

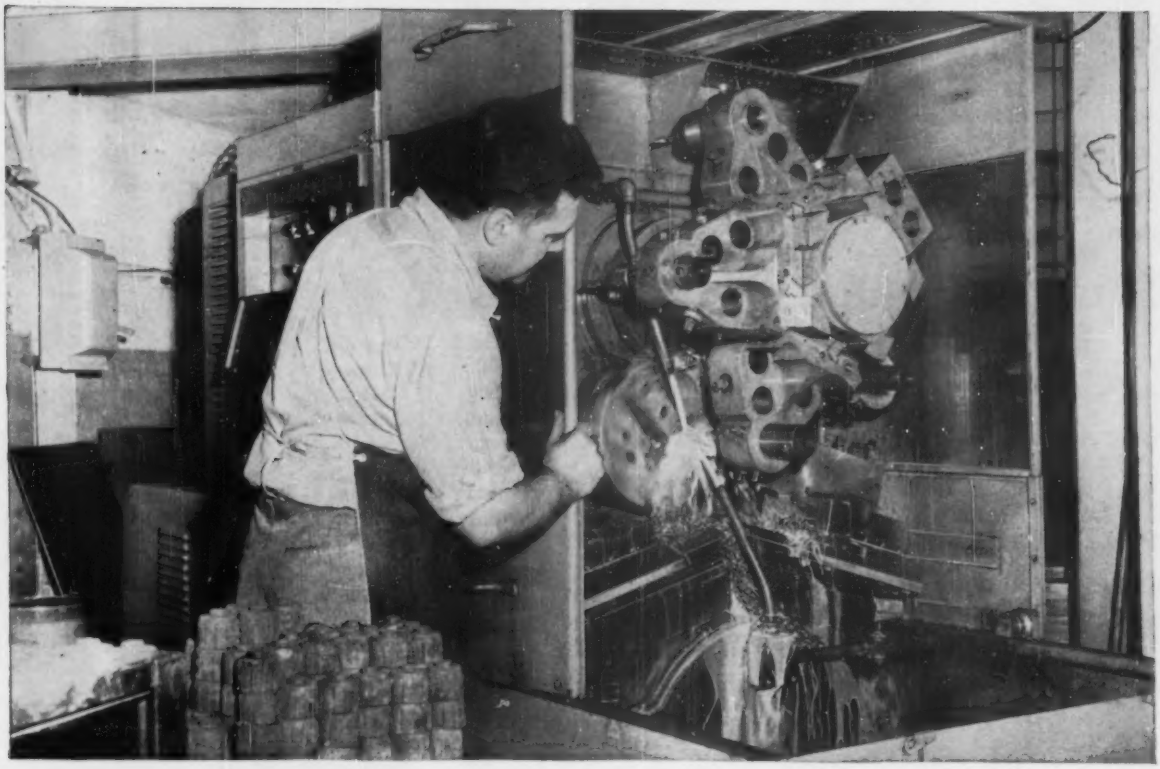
Sales are up over 50 pct., glamor being added.

While automobiles have had a stormy first half, saleswise, sales of heavy truck trailers have gone on to establish a record first half. Big over-the-highway truck trailers aggregated about 78,000 units sold in 1955 worth about $371 million. The 1955 sales figure represented a 51 pct advance over sales the previous year. This year, with the sales curve still advancing after a record first half, truck-trailer builders are confident of selling 82,000 of the big trailers.

Truck-Trailer Manufacturers' Association members report that about 50 pct of this business is represented by the big "Vans." Of this fraction, about 50 pct are now covered with an aluminum skin as truckers seek to reduce vehicle weight, and this percentage has been growing since the close of World War II. The average Van utilizes about 2500 lb. of aluminum in its trailer, which represents about 25 pct of total weight.

With the aluminum trailer, a new touch is in the offing that spells brisk volume for producers of anodizing equipment.

Aluminum truck wheels, a brisk sales item on the West Coast, are still not strong on the East Coast, but with the constant struggle to increase cargo carrying capacity while reducing carrier weights, builders expect to see some action in development of the aluminum wheel in Midwestern and Eastern areas. At the same time, plastic for tank trucks is already here on a limited basis, and trailer builders expect to see more.



If this isn't the world's best investment—what is?

HIGHLY PRODUCTIVE machine tools have long been recognized as one of the best investments any metalworking company can make.

And when a standard-designed machine tool pays for itself in less than a year, it's an investment that's hard to beat!

Two Warner & Swasey 2 AC Automatics did just that for The Thew Shovel Company, Lorain, Ohio. They turned in cost savings from 47% to 77% machining 38 different cast and forged steel parts for Lorain power shovels and cranes. Annual dollar savings exceeded the cost of both machines plus tooling!

Lot sizes averaged about 200 pieces—ranging from 36 to 2,000—demonstrating the fast setup features of these Warner & Swasey Automatics. Their simplicity of operation permits grouping machines so each 2 AC operator can also handle second operation work on adjacent turret lathes—an additional saving not included in the figures above.

On many jobs in your own plant—some you may think of as strictly "turret lathe jobs"—Warner & Swasey Single Spindle Automatics can speed production, cut floor-to-floor time, and slash machining costs. Our Field Representative will be glad to show you exactly how!

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS ... WITH A WARNER & SWASEY

EXPANSION IN INDUSTRY

Titanium:

Plan to boost ingot capacity by 80 pct

Titanium metal production at the Henderson, Nev., plant of Titanium Metals Corp. of America is being expanded. Output of titanium sponge is scheduled for a 50 pct boost, ingot for an 80 pct increase.

National Lead Co. and Allegheny Ludlum Steel Corp. are the parent companies of the titanium producer.

When this project and the previously announced expansion program are completed, total sponge capacity of the Henderson installation will be 25 tons per day, or about 9000 tons per year. Ingot capacity will be 30 tons per day, or 11,000 tons per year.

Included in the plans are a new melt shop unit for production of ingots.

Overall cost is estimated at about $15 million.

Canned Motors

Medium motor induction dept., General Electric Co., Schenectady, N. Y., will spend $2 million for an expansion of facilities for manufacture and testing of "canned motors" and electromagnetic pumps for atomic industry.

The move will result in tripling the number of department employees within the next 12 months.

The company considers electromagnetic pumps as a definite step forward in the pumping of liquid metals because they eliminate the need of moving parts.

You'll Know "Who's Calling, Please."

THEY SAY one picture is worth 1000 words. But with the picture-phone, in advance stages of commercial development at Bell Telephone Laboratories, you can have both. Unit will be commercially feasible because picture is transmitted over standard telephone lines. Bell technicians are now concentrating on miniaturizing the unit.

Expansion Briefs

Vanadium-Alloys Steel Co., Latrobe, Pa.; double the capacity of mill devoted exclusively to production of high speed steel.

Michigan Chemical Corp., St. Louis, Mich.; new labs to be constructed for research in field of rare earths.

Chicago Bridge and Iron Co.; landed a contract for construction of a steel sphere to house atomic reactor for Commonwealth Edison Co., Chicago.

Pittsburgh Consolidated Coal Co., Pittsburgh; building a 10-inch pipeline from Hanna Coal Co. mines, Cadiz, O., to Cleveland. Coal will be pulverized and suspended in water.

American Filter Co., Inc., Louisville, Ky.; 60,000 sq ft expansion of its Famco, Inc., plant Louisville.

Kaiser Metal Products Inc., New York; constructing a 201,000 sq ft warehouse in Bristol, Pa.; cost about $1 million.

Wesson Multicut Co., Detroit; building a new plant in Brighton, Mich.

Progress Manufacturing Co., Inc., Philadelphia; constructing a new manufacturing plant in North Philadelphia; cost $2 million.

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.; landed multi-million contract for manufacture of structural steel mill equipment for U. S. Steel Corp.

The National Supply Co., Pittsburgh; new store building south of Butler, Pa., to replace the current building.

The handwriting is on the wall . . .

Eventually all major annealing departments will be composed entirely of Single Stack Furnaces

And most of them will be made by

Lee Wilson® ENGINEERING COMPANY, INC.

20000 WEST LAKE ROAD • CLEVELAND 16, OHIO

SINGLE-STACK RADIANT TUBE ANNEALING FURNACES

MAKE THE BEST METALS BETTER

® ORIGINATORS AND LEADING PRODUCERS OF SINGLE-STACK RADIANT TUBE FURNACES

how to rustproof steel in warehousing

When unusual times and conditions make it necessary for you to warehouse any kind of steel, even such sensitive steels as black plate and cold rolled, here's how you can combat the rust problem. Wrap your steel in Ferro-Pak, Cromwell's volatile corrosion inhibitor paper. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4803 South Whipple Street, Chicago 32, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®
by Cromwell

For over 38 years—
"Paper Engineers" for Steel

REPORT TO MANAGEMENT

Who Runs Your Pension Plan?

Chances are your company contributes to an employee welfare or pension plan of some sort. Increase in number and size of these plans in recent years has put almost every company of any size in this category.

It might be wise to take a close look at your plan, determine if it's well run—and honestly administered. A two-year inquiry into administration of employee welfare and pension plans by a Senate subcommittee has disclosed many instances of dishonesty and irresponsibility. Make sure this doesn't include your plan.

Tendency on the part of business is to blame all mismanagement of these plans on the unions. It's easy for management to wash its hands of the whole affair and leave it up to the union. Actually, management's disinterest and neglect has contributed to much of the abuse of these funds.

Most plans are honestly administered and with a high degree of responsibility. But abuses do exist, and you owe it to your company and employees to see that they don't get started.

Where Trouble Starts

Most plans are administered by trustees, with both management and labor represented. Your first step is to make sure that your representation is doing its job conscientiously.

The subcommittee reported that indifference was found in most cases of improper management or waste. In one case, an employer group made no attempt to administer the plan, appointed no trustees, failed to request financial reports. No wonder the plan was characterized as "grossly mismanaged."

One possible weak point lies in rules governing eligibilty of employees for benefits. Investigation showed that some are too liberal, others too conservative. In most cases, however, danger exists from too loose interpretation.

Insurance is another point to take special interest. Insurance carriers should be selected through competitive bidding, or at least on the basis of thorough study. "Kickbacks" from brokers and agents frequently occur. All funds should be audited regularly.

Although many plans were the result of union demands, it is still the responsibility of management to do its best to see that provisions are carried out, that employees are protected from abuse.

How Much Is Involved?

Probably the size and scope of these plans isn't fully recognized. At the end of 1954, according to the Senate subcommittee report, 29 million workers and 46 million dependents were covered to some extent by these programs.

Employer contributions to all programs amounted to $4.5 billion and employee contributions to $2.3 billion in 1954. Reserves of pension funds alone aggregate $20 to $25 billion, according to a Dept. of Labor study.

What Should Be Done

A Federal registration, reporting and disclosure act is recommended by the Senate subcommittee.

Its primary objective would be "one of assuring the immediate and long-range stability of private welfare and pension programs without impairing their voluntary or free-bargaining character."

But with or without the law, it is management's responsibility to make sure that its contributions, as well as that of its employees, don't go down the drain because of neglect or disinterest.

INDUSTRIAL BRIEFS

Atoms for Everything . . . A license to operate a research reactor has been issued by the Atomic Energy Commission to the Battelle Memorial Institute of Columbus for a 10 year period. The reactor will be used in industrial research activities including research for chemicals, petroleum, metals, machinery, ceramics, electronics, food processing, textiles, and pharmaceuticals industries.

How To Make More . . . The University of Michigan's business research team financed by the Brookings Institution is now studying problems connected with the expansion of steel capacity. Russia, West Germany, and Great Britain all have faster growing steel industries than the U. S.

Two Way Stretch . . . Domestic and foreign holdings of Pioneer Latex and Chemical Co. have been acquired by the Borden Co.'s Chemical Div. The Middlesex, N. J., firm, manufacturer of protective coatings and other products for the textile, flooring and adhesives industries, will be merged with Borden's Resinous-Reslac Dept.

Weather or Not . . . An environmental testing chamber used to evaluate the effect of various weather conditions on airborne electronic systems has been installed at the Westinghouse Electric Corp.'s Air Arm Div., Baltimore, Md.

Sweet Selling . . . Merchandising of Pacific steel boilers and other heating products of the Pacific Steel Boiler Div., Johnstown, Pa., has been expanded in southern New Jersey and Delaware by new sales representatives. R. B. Sweet & Associates, Abington, Pa., is now representing the Division in these areas.

Beats the Abacus . . . A "mathematical wizard" known as the "IBM 704" is helping Westinghouse engineers solve intricate design problems. The computer has been used to calculate power problems of atomic reactors, to determine stresses in generator shafts, and to design turbine generators. In just 22 seconds, the computer is capable of solving 30 simultaneous equations involving 54,000 multiplications and the same number of additions, according to Dr. E. L. Harder, director of engineering and service Analytical Dept., at Westinghouse.

No More Heats . . . Fred H. Johnson, after 43 years' service as an engineer in the steel industry, is retiring from Inland Steel Co. He has been chief engineer at the company's Indiana Harbor Works from 1949 until 1955, when he became assistant to the vice president in charge of planning and administration.

"When I start asking for a raise, you play 'Hearts and Flowers'!"

New Horizon . . . Horizons Inc., Cleveland industrial research organization, has been engaged by the Kennecott Copper Co., New York, as consultants in the design, erection and operation of a pilot plant to produce zirconium in the Cleveland area. The plant marks the first non-government sponsored piloting of the important nuclear metal.

A Lot of Atoms . . . National Lead Co. has been granted an extension of a contract with the U. S. Atomic Energy Commission for operation of the Commission's Feed Materials Production Center in Fernald, O. Effective July 1, 1956, the contract will extend to June 30, 1961, with an annual estimated operating cost of $38 million.

Best Seller? . . . New booklet, "Aluminum in stock at Ryerson," includes information on aluminum plates, sheets, coils, rods and bars in stock, along with data on the company's forming, shearing, slitting and sawing facilities. It also covers new stocks of Reynolds aluminum to service the Chicago and Milwaukee, and surrounding area, markets.

Dutch Ovens? . . . Hupp Corp., Cleveland, has acquired a controlling interest in a Dutch manufacturing Co. — Apparatenbouw Nedalo Nv, of Hengelo, The Netherlands. The purchase gives Hupp its first manufacturing facility in Europe. The Dutch plant will initially produce oil space heaters for European markets.

No Shock . . . Electric Service Manufacturing Co., Philadelphia, has been acquired by H. K. Porter Co., Inc. Electric Service manufactures electrical equipment for the utility industry, heavy industrial plants, and the transportation industry.

Weirzin's tightly bonded zinc coating takes the deepest draws with ease—does not crack, peel or flake under the severest fabricating operations.

Weirzin's malleable zinc coating lubricates dies without leaving a zinc deposit—reduces die maintenance—increases die life.

Weirzin, chemically treated, takes and holds paint, enamel, lacquer and lithographic ink indefinitely—eliminates underfilm corrosion.

Weirzin stops inventory losses due to rust—eliminates pickling—reduces cleaning and buffing—cuts handling before, during and after fabrication.

How to wrap up product superiority...at lower cost

Weirzin

electrolytic zinc-coated sheet

No matter how extreme the stresses of fabricating operations, electrolytic zinc-coated Weirzin stands up under them. Its tightly bonded malleable coating flows so smoothly with the ductile steel base during a deep draw that Weirzin seldom needs additional coating for corrosion protection.

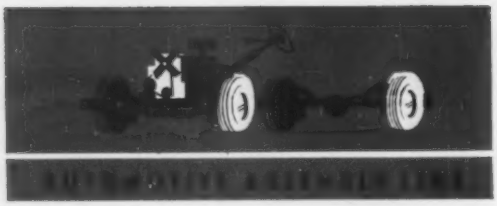
Here is a different kind of steel sheet. For ease of fabricating, for durability, for long-range economy, no other "similar" metal measures up to Weirzin. Weirzin is produced in a continuous strip up to 36" wide. It is available in coils or cut lengths down to ½" strip—gauges .010 to .0478. Phone or write now for the money-saving, customer-pleasing facts about Weirzin!

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION



Jockeying For 1957 Sales Race Begins

Chevrolet and Ford will go at it again for first place but another big battle is shaping up for the third spot . . . Plymouth's sales campaign will spearhead Chrysler Corp.'s entire promotional effort—By *T. L. Carry*.

◆ NOW THAT MODEL changeovers are practically a thing of the past, the auto industry is busy drawing the battle lines for the sales race in 1957.

As far as Ford and Chevrolet are concerned this year, what started out as a race has turned into a rout with Ford on the short end. How the two leading contenders will fare next year remains to be seen and hinges on several factors not the least of which is productive ability. And Chevrolet still has the edge.

But there is another sales fight which although it has not received as much publicity, is just as interesting because it involves three producers—Buick, Plymouth, and Oldsmobile.

Who's In Third? . . . Plymouth, the traditional third runner in years past, lost its position in the industry to Buick in 1954 and so far has not been able to recapture it. Once you lose something in the highly competitive automotive game, it takes years to get it back and it's possible that you never will regain it.

But this has not fazed Plymouth in the least.

L. L. Colbert, Chrysler Corp. president, says that the company will apply increasing emphasis on selling the Plymouth in 1957.

Chrysler is deadly serious about the project. Mr. Colbert says that selling the Plymouth will be the corporation's number one job and that the Plymouth sales program is going to serve as a spearhead for Chrysler's whole promotional effort.

Good For The Gander . . . Mr. Colbert, a traditional optimist, believes that 1957 will be a good automobile year. He says that the industry will flourish because economic conditions next year will be as good as or better than they were in 1955, the previous record year.

Mr. Colbert might be right regarding the prospects for 1957. But if they are good for Plymouth, they will be equally good for competitors.

That brings up a fact which Mr. Colbert may not have overlooked but one which he did not mention.

Oldsmobile, currently the fifth best selling car, is getting uncomfortably close to Plymouth in retail registrations. In fact the Oldsmobile is a lot closer to fourth place than Plymouth is to third at this time.

Separate Dealer Plan . . . Registration figures for the first 6 months of this year show that Buick, with a total of 294,194 is leading Plymouth by 36,876 cars. Plymouth, presently in fourth place, is leading Oldsmobile by 19,117 units. In other words, Buick's lead over Plymouth is almost twice as big as Plymouth's is over Oldsmobile.

MOLTEN ALUMINUM ALLOY is poured into molds of one of 16 automatic casting machines at Chrysler's new Highland Park, Mich., piston foundry. The foundry will enable Chrysler to increase its piston output by 50 pct.

More Chrysler Pistons

Chrysler Corp. has just completed an extensive expansion of its Highland Park, Mich. alumi-

"Automated" chromium bath helps cut plating costs

♦ Chemical control greatly simplified with Unichrome SRHS® Chromium Plating Process

♦ Manhours saved . . . bath automatically kept in optimum balance . . . consistently good results assured

Remarkable feature of SRHS Solution is the *self regulation* of important chemical constituents. In effect, this means that control has been automated.

OPERATION IS EASIER

Unlike ordinary chromium, there's no need to make lengthy analyses of samples of the SRHS solution . . . no need to lose time determining additions to the bath to bring it up to proper balance for good plating. Instead, the unique formula of the SRHS compound permits a reserve of undissolved chemical to be available in the tank and ready to dissolve automatically in just the right amount needed to replace losses. Just a simple hydrometer reading tells when to add more SRHS compound.

By maintaining themselves continuously in peak plating balance, the SRHS baths provide not only a more foolproof operation, but also better results.

RESULTS ARE IMPROVED

Through this *automated* control of plating balance, the unusual benefits of SRHS are achieved to the fullest. Plants plate up to twice as fast as with ordinary chromium . . . save on power consumption . . . gain more production capacity without extra equipment . . . and reduce "burning" and "missing" (major causes of rejects).

This process is just one of Metal & Thermit's many Unichrome processes and materials which provide opportunities to cut your finishing costs . . . opportunities to turn out a better product through a better finish. We'd welcome the chance to work with you.

Unichrome is a trade mark of Metal & Thermit.

PLATING MATERIALS
ORGANIC COATINGS
TIN & TIN CHEMICALS
CERAMIC MATERIALS
RADIOGRAPHIC EQUIPMENT
WELDING SUPPLIES
METALS & ALLOYS
HEAVY MELTING SCRAP

UNICHROME
Trade Mark

METAL & THERMIT
CORPORATION
GENERAL OFFICES: RAHWAY, NEW JERSEY
Pittsburgh • Atlanta • Detroit • East Chicago • Los Angeles
In Canada: Metal & Thermit–United Chromium of Canada, Limited, Toronto

Extra Rugged...

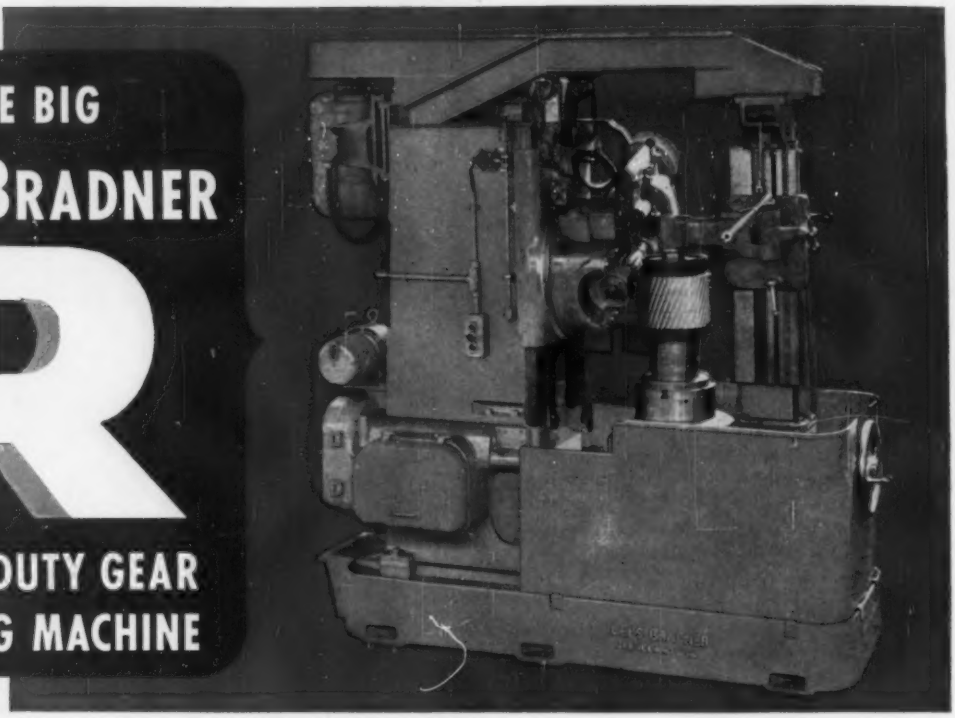
For The ROUGH Hobbing Jobs!

THE BIG

LEES-BRADNER

R

HEAVY-DUTY GEAR HOBBING MACHINE



Built rugged and reliable to handle those rough, tough gear hobbing jobs . . . that's the new Lees-Bradner Model "R".

It's designed to hob spur or helical gears up to 1¼ DP with a left or right hand maximum helix of 45°.

The Model "R" features fast loading and unloading, ready access to index and feed change plus easy operation and maintenance.

Write for your free brochure giving the detailed capacities and specifications of this new heavy-weight hobbing machine.

SPECIFICATIONS

Maximum outside diameter with tailstock column	16"
without tailstock column	18"
Minimum C/D hob to work	1½"
Maximum C/D hob to work	12"
Travel	18"
Maximum diameter of hob (3-1, 6-1, or 12-1 backgearing)	10" x 10"
DP range	1¼ DP to 16 DP
Maximum manual (or electric) shift of hob	6"
Diameter of hole through work spindle	2"
Machine weight	13,000 lbs.

the LEES-BRADNER *Company*

CLEVELAND 11, OHIO • U.S.A.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
AUG. 18, 1956	100,181	22,132
AUG. 11, 1956	108,155	19,493
AUG. 20, 1955	138,209	21,316
AUG. 13, 1955	151,505	24,310

*Estimated. Source: *Ward's Reports*

num piston foundry. The addition of new equipment has increased the foundry's capacity by 50 pct.

T. R. Patrick, foundry general manager, says that up to 75,000 pistons can be produced in a 24-hr period compared to the previous high of 52,000.

The new facilities will enable Chrysler to supply nearly all of the piston requirements for its line of cars and trucks.

Among the new pieces of equipment installed are 16 automatic casting machines and eight dry-hearth combination melting and holding furnaces. Chrysler says the new equipment will improve the quality of the pistons and allow closer control of casting processes.

Dimensional tolerances will be easier to maintain as key operations are automatically cycled.

The new casting machines open and close automatically with molds and cores held at controlled temperatures by means of a water cooling system. Steel inserts are automatically placed on the cores. These serve to control expansion and contraction of the pistons when they are operating in an engine.

The piston foundry is part of the newly-created Parts and Equipment Manufacturing Div. which is headed by Fred Osann, Jr.

Ford's Finances

Ford Motor Co. has no comment on reports that it has borrowed $250 million for expansion of its facilities but it's a sure bet that the company has reversed its previous pay-as-you-go expansion policies.

In a recently revised report, Ford says it has spent $1,890,000,000 for expansion since January 1, 1946, through the first half of this year. In addition, Ford is investing another $935 million for new facilities between now and the end of 1959.

Add to this the cost of bringing out the "E" car, reportedly another $350 million, and you have quite a sizable sum.

Some observers believe that the loan may have been negotiated because Ford stock reached the public for the first time this year and that the company will use more traditional means of financing from now on.

Dealer Law:

Ike signs measure, but with misgivings. Court test seen.

Although the auto dealers' day-in-court bill has been signed into law, it will be some time before things quiet down on the retail sales front.

President Eisenhower signed the bill reluctantly. He intimated that there would likely be a court test of the law because it is an intrusion of the Federal Government into an area ordinarily reserved for private business.

If there is a court test, it is likely to come soon and there already may be a precedent set for any decision that is reached.

Just recently, General Motors won a case in Colorado when a court ruled that a state law regulating franchises between dealers and manufacturers was unconstitutional.

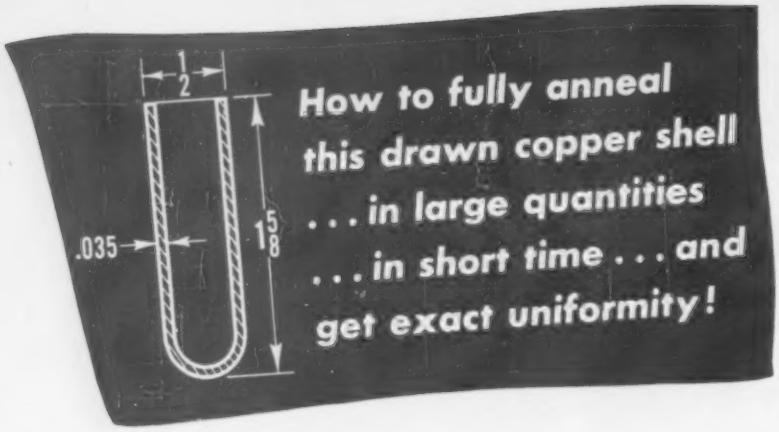
GM contended that the Colorado law prohibited the company from exercising its rights to select dealers and would therefore make dealer selling arrangements inoperative. In other words, the company claimed that restrictions in the law would prohibit it from competing with other producers.

If there is any similarity between the Colorado statute and the day-in-court bill, there is a possibility that a precedent has already been set.

The person who may ultimately suffer the most from the present legislation is the consumer.

THE BULL OF THE WOODS By J. R. Williams

YOU HAVE TALENT BUT YOU SEEM TO SNEAK UP TO YOUR ART CLASS LIKE IT WAS A CRIME! BUT THAT FIRING JOB YOU STRUT TO WORK LIKE YOU WERE REALLY SOMEBODY!
WHEN I CAN PAINT TH' MAJESTY OF A LOCOMOTIVE SPEEDIN' THRU TH' LIGHTS OF TOWNS, TH' FLASH O' FLAME FROM TH' FIRE BOX DOOR, PISTONS CHURNIN' US THRU TH' PINKS OF DAWN -- STID OF PAINTIN' SUGAR BOWLS OF PANSIES ER A DISH OF BANANAS AN' GRAPES -- THEN I'LL STRUT UP THERE, TOO!
THE LONG ROAD
J.R.WILLIAMS 8-22



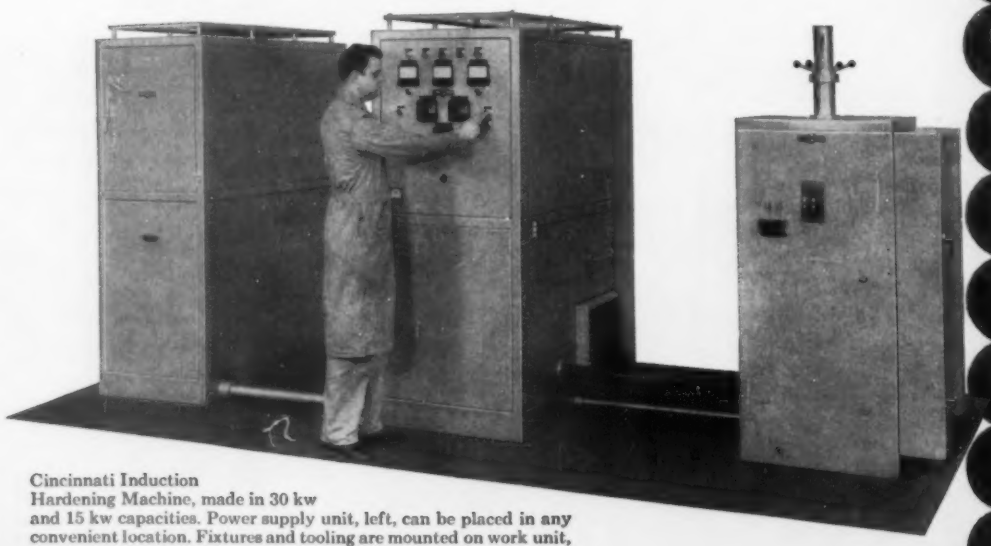
Cincinnati Inductron*

does it in 1.7 seconds per piece

Work hardening from the drawing operation interfered with subsequent operations, so these shells had to be fully annealed. Furnace heating in mass did not produce the high uniformity of anneal required, and the pace of production prohibited an increase in the heating time.

The problem was presented to Cincinnati heat treating specialists, and they devised a low-cost method of heating the parts, individually, in a new 15 kw *Cincinnati Induction Hardening Machine. A full anneal was produced at 1200°F. in 1.7 seconds. An automatic work handling system delivers the parts at the required rate.

If you have a selective surface hardening or part heating problem, talk to Cincinnati—*builders of both Flamatic flame hardening and induction hardening equipment.* Call in a Process Machinery Division field engineer. He is ideally equipped to evaluate your needs and give you unbiased recommendations as to the most economical and efficient method.



Cincinnati Induction Hardening Machine, made in 30 kw and 15 kw capacities. Power supply unit, left, can be placed in any convenient location. Fixtures and tooling are mounted on work unit, right. Bulletin M-1938 gives full details. Write for your copy.

CINCINNATI **induction** *hardening*

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

U. S. Plans More Marketing Statistics

Marketing specialists will get more and better statistical reports from government next year . . . Total of $35 million earmarked for studies . . . Wages, prices, many others included—By G. H. Baker.

◆ INDUSTRIAL MARKETING executives can count on a bumper crop of fresh and useful new government statistics between now and next June 30. A tally of the various statistical studies recently authorized by Congress shows that Uncle Sam will spend a whopping $35 million—up $3 million from last year—for production of facts and figures in the 13-month period starting last July 1. In addition, another $2.9 million will be spent for the period census programs.

Here's how this boom total of $35 million will be spent:

Labor Statistics . . . $6.9 million will go for a study of retail wages. In addition, lesser amounts will be spent to study labor turnover, work injuries, and to publish a new edition of the Occupational Outlook Handbook.

Price Indexes . . . Bureau of Labor Statistics gets an additional $100,000 to improve its monthly Consumer Price Index (better rent data, more frequent pricing of certain commodities, better review of outlet samples in 20 cities).

Construction and Housing . . . Slightly more money than last year to bolster the existing polls of residential and commercial construction.

Production and Distribution . . . About $1.5 million extra is being set aside to improve statistics on agriculture and the earning capacity of farmers. Also, better sampling of retail inventories is contemplated. Foreign trade statistics will be carried on at the same level as last year.

Population . . . Little change in sight. But some new money is being made available to study low-income rural population.

National Income . . . Detailed studies will be made of economic trends from several approaches, including consumer spending, manufacturers' inventories, planned expenditures for new plant.

What's with WOC's?

Businessmen serving as government consultants will have an added interest in the outcome of the November congressional elections, because control of Congress will determine the type of treatment they'll get.

Republicans for the past two years have tried, for the most part unsuccessfully, to restrain almost unceasing flow of attacks on business men in government from the Democratic majority. Favorite whipping boys of the Democratic probers have been the business experts serving as consultants without compensation ("WOC's).

Allegations that the GOP is the "big business" party has been a popular political weapon of the Democrats for decades.

If the Democrats retain control of Congress, which is not an impossibility even if President Eisenhower retains residence in the White House, the attacks on use of businessmen by the Administration will if anything be stepped up. If Mr. Eisenhower manages to lead the party to recapture control of Capitol Hill, the Democrats will lose their leverage.

Labor Takes Aim at Congress

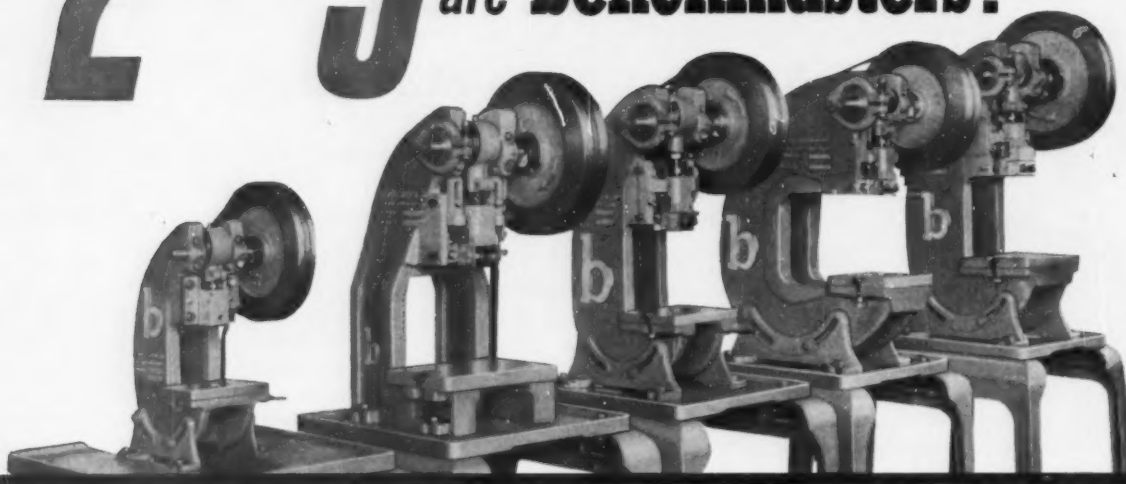
Organized labor may not endorse a presidential candidate this year, but will concentrate on Congressional elections.

George Meany, AFL-CIO president, indicates that this strategy is now agreed on by top union leaders. Privately, they may concede the presidential race to President Eisenhower.

Labor chiefs openly admit they are preparing to spend freely to get the "right kind" of a candidate elected to Congress. The "right kind" are usually Democrats.

To demonstrate their "hands off" policy, both Meany and William Schnitzler, AFL-CIO secretary-treasurer, testified before both platform committees, then left town before opening of the conventions.

2 out of 3 small presses purchased are benchmasters!



That's a fact... out of all small punch presses purchased 2 out of 3 are supplied by Benchmaster!

Being first choice by so wide a margin is no accident. First, Benchmaster builds small presses in 3 *distinct capacity ranges*... 2, 5 and 8 tons. Second, consider the various models available... *plain inclinable models, backgeared types, deep throat presses, fixed bed gap frame types, half presses, multiple ram presses and special stroke models!*

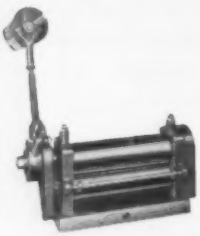
Add to this the complete range of Benchmaster Accessories... AUTOMATIC DIAL INDEX FEEDS, AUTOMATIC FRICTION ROLL FEEDS, ROLL STRAIGHTENERS, KOIL KRADLES, BARRIER TYPE GUARDS, CHUTE TYPE PRODUCTION PANS, ETC. And remember, Benchmaster's acceptance is world-wide—wherever you go there's a Benchmaster—and Benchmaster service!

When buying new presses choose the winner... *First in Sales, First in Quality, First in Economy!*

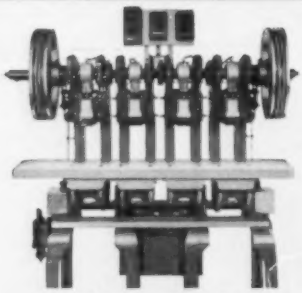
Wherever there's a press operation, this Benchmaster Equipment will cut costs, save time!

BENCHMASTER STRAIGHTENERS—(Shown in combination with Koil Kradle.) Adjustable, power driven rolls; removes kinks—straightens out coil stock before feeding to feed mechanisms or to press. Many sizes, write for details.

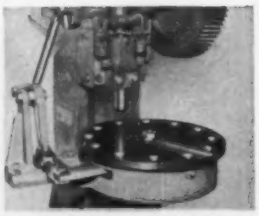
BENCHMASTER KOIL KRADLES—Automatically supplies a slack loop from which any machine can draw. Overcomes inertia of heavy coils—easier loading. Many sizes. Ask for data.



BENCHMASTER AUTOMATIC FRICTION ROLL FEEDS—A low cost roll feed made especially for all small presses. Has automatic roll lifters, feeds almost any material. Two models: 0-3" and 0-6" cutoff. 3, 5, 7 and 9" roll widths.



BENCHMASTER MULTIPLE RAM PRESSES—Any number of units required—rams can operate in unison, can alternate or can be staggered... all operate on same crankshaft... stroke lengths can also vary on each ram... separate die stages on each bed cut tooling costs, permit quick replacements. Costs ½ to ⅓ of large presses doing similar work; doubles production!



BENCHMASTER DIAL INDEX FEEDS—Links with ram, automatically indexes, placing new station under ram with each stroke. Up to 6000 strokes per hour. Cuts labor—makes your press operations almost automatic. 12" or 15" diameter tables, up to 24 stations.

FREE BENCHMASTER CATALOG! Write today!

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World's largest manufacturer of small punch presses and mills.

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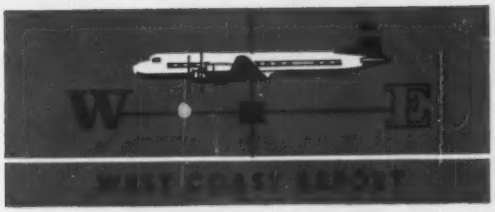


What's Metalworking's Future in Seattle?

Cheap power seen as master key . . . Hydroelectric potential is 40 pct of U.S. total . . . Will be backed up by natural gas beginning this fall . . . Foreign markets important—By R. R. Kay.

◆ WHAT'S metalworking's future in Seattle's economy? It's the No. 1 industry in the area today, but business is chiefly in huge military aircraft orders—over $2.5 billion worth! And another half-billion dollars is being spent for commercial airliners.

What are the chances of developing a market for diversified metalworking products and services?

On-the-spot study indicates favorable answers are pretty much dependent on: (1) continued military and commercial aircraft business; (2) vast increases in Pacific Northwest power supply; (3) population growth; and (4) growing markets in Alaska and the Orient.

Big Boy . . . Metalworking giant in Seattle is Boeing Airplane Co.—employs 40,500 of 44,000 workers in the transportation equipment industry. Area's total metalworking employment is 60,000 in 750 plants. Majority of shops are small, with less than 20 plant workers.

Cheap power is the master key. The region's hydroelectric potential, 40 million kw, is 40 pct of the entire U. S. hydroelectric resources.

And there'll be a supply of natural gas here starting this fall.

If power developments get going in a big way, look for a metalworking upsurge. The Pacific Northwest makes about 35 pct of U. S. primary aluminum—but 75 pct of the end-products are brought in. Seattle could land a nice share of new aluminum-products manufacturing.

Seattle today has large, well-established plants making railroad cars, heavy-duty trucks, and materials handling equipment. Firms sell nationally, and could grow.

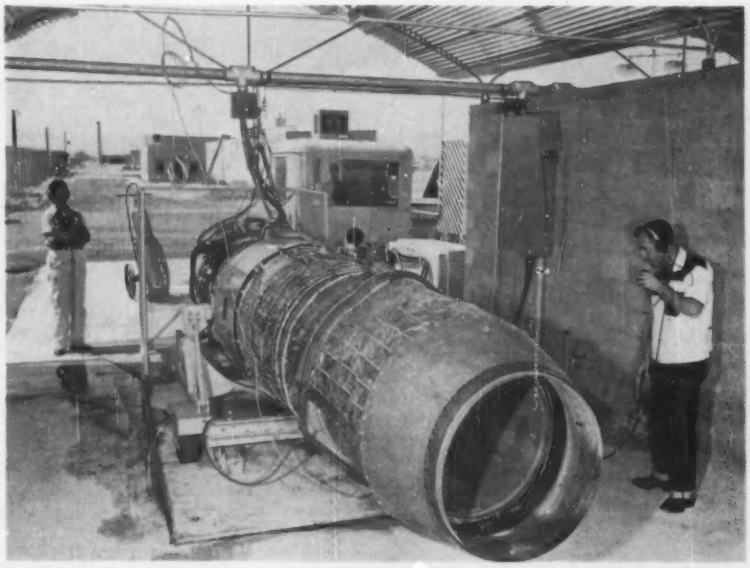
Naturally . . . Output of fabricated metal products (stainless steel particularly), electrical machinery, water heaters is increasing. When natural gas comes to the area in several months, watch for: (1) more metalworking activity using gas; (2) manufacture of gas appliances.

Non-ferrous metalworking is growing. Outlook is good for brass and bronze products. Need comes from expanding pulp and paper industry and oil refinery construction.

Metropolitan Seattle and nearby Tacoma are getting a good share of the westward trek. Their 1.3 million population is 50 pct higher than in 1940. People are still coming — and bringing with them a ready market for products for home and industry.

World Markets . . . Growing importance of Alaska and Japan on the world scene is favorable to Seattle. City's blessings include: (1) strategic spot on the map—nearest major U. S. port to Alaska and Japan; and (2) excellent deep-water harbor and canal system to inland lakes.

If port activity swells, it will produce badly needed business for the lagging shipbuilding and repair industry.



SCORPION F-89J ENGINE is tested on new engine run-up stand at Northrup's Palmdale, Calif., plant. Engine rests on a floating concrete pad surrounded by felt. Technicians use radio to contact control booth in rear.

what's the DIFFERENCE . . .

the DIFFERENCE is . . .

To you, the user or buyer, the most important difference between MARVEL High-Speed-Edge Hack Saw Blades and ordinary blades is the *unequalled* performance you get from MARVEL Blades.

Performance reflected in higher production (faster cutting-off), greater accuracy of cut-off blanks, and longer blade life has made MARVEL the preferred blade in every kind of metal sawing operation.

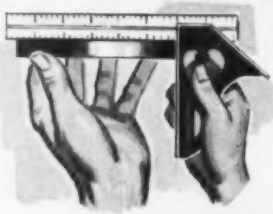
To get the *difference* in performance, always insist on MARVEL High-Speed-Edge Hack Saw Blades. Leading Industrial Distributors have them in stock.

Write for "The MARVEL Story." It has complete details on MARVEL High-Speed-Edge Hack Saw Blades and Hole Saws.

HIGHER PRODUCTION

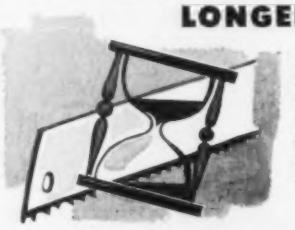
Unbreakable MARVEL High-Speed-Edge Blades can be worked faster and harder than any other blade with complete safety. They will withstand the highest speeds and heaviest feeds attainable on any make hack sawing machine. MARVEL Blades will cut any machineable metal. No wasted time changing blades for different materials.

GREATER ACCURACY



Composite construction permits MARVEL Blades to be tensioned from 200% to 300% more taut than ordinary blades. This produces greater rigidity of the high-speed-steel cutting edge, resulting in maximum obtainable accuracy of cut-off blanks.

LONGER BLADE LIFE

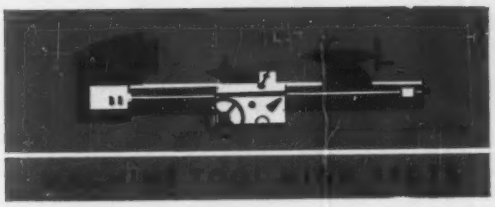


Each MARVEL High-Speed-Edge Hack Saw Blade is triple tempered to assure maximum toughness of the cutting edge. MARVEL Blades not only give you longer life, they assure a *more efficient* cutting life, with resulting lower blade costs.

B-1121

ARMSTRONG-BLUM
MFG. CO.
5700 WEST BLOOMINGDALE AVE. • CHICAGO 39, ILL.

MARVEL *Metal Cutting* SAWS
Better Machines—Better Blades



What Ten Factors Form Operating Cost?

This new machine tool replacement formula requires only a pencil, ruler and compass . . . It makes possible ready cost comparisons of old and new machines . . . Gives hourly operating figures—By *E. J. Egan, Jr.*

◆ DO COMPLICATED machine tool replacement formulas have you baffled? There's an interesting new one that's literally child's play. You solve it by drawing lines on a chart, more correctly termed a nomogram. And you'll find all the tools you need—a pencil, ruler and compass—right in your youngster's school bag.

Whole idea assumes that you consider buying a new machine to cut production costs, increase production, or both. And you want to know—not guess—exactly how the new one will stack up with your present equipment in cost of operation.

The Big Ten . . . Basic theory is that just 10 factors affect the true cost of operating a machine tool for one hour. They are: (1) initial cost, (2) depreciation factor, (3) space required, (4) specific cost of floor space, (5) cost of energy (current), (6) power consumption, (7) utilization factor, (8) direct hourly wages, (9) indirect hourly wages, (10) unproductive wage factor.

All of these factors (call them "knowns") fit into a not-too-complicated equation. You calculate to get some of these known values, snag others from machine tool catalogs, simply estimate the remainder. Put them in place in the equation and you're all set to solve for the "unknown" item, the cost of operating the machine tool in question for one hour.

Easy Does It . . . But here's the beauty of the plan: you don't have to solve the equation each time you want to know the hourly cost of operating an old or new machine. The nomogram chart does it for you.

The nomogram consists of a number of printed lines scaled off to cover the range of values you might normally expect for any of the known cost factors. For example, the line on which you'd pin-point your electric power cost is scaled off from zero to four cents per kilowatt hour.

So, with known values, chart, pencil, ruler and compass at hand you're all set. By following instructions it shouldn't take you more than two minutes to trace a path from one value point to another on the nomogram. Where your pencil stops, you simply read off the operating cost per hour.

New Versus Old . . . You do this once for your old, questionably efficient machine tool. To evaluate the one you're being urged to buy, you grab another nomogram sheet and go through the ruler-and-compass routine again.

Of course you'll be using changed values for cost factors like initial price, space required, depreciation and direct wages. Some will be higher, others lower than for your present equipment. But the nomogram automatically proportions them into the hourly cost answer you need.

Swivel Chair System . . . Replacement plan and nomogram technique were originally developed by Realf W. Ottesen, former head researcher of the Norwegian Motor Manufacturers' Institute. System was used to set up general retooling rules for member plants.

Mr. Ottesen, now affiliate senior designer at McCullogh Motors Corp., Los Angeles, presented a paper on the subject at the recent Semi-Annual ASME Meeting.

Numbers Game Gains Another Convert

▪ Automation of machine tools with numerical controls is winning favor with the Air Force.

▪ Twenty-two milling machines contracted for by the Air Materiel Command with Kearney and Trecker Corp. will be converted to automatic numerical control. Originally the contract specified template control.

▪ In addition, 55 template controlled, contour and profile millers and forty-eight skin mills also under contract will be similarly facelifted. It's estimated that productive capacity of the skin mills will be improved 50 pct by the switch.

▪ Air Force was sold on converting the controls after seeing results of an MIT study financed by the AMC. It proved milling machines, especially profilers, adapted well to automation and that increased productive capacity resulted.

▪ Initial delivery of the automatically controlled units, slated for airframe, engine and strut manufacturers, is set for December 1957.

Lapointe Machine Tool Company, Hudson, Massachusetts

FIRST OF ITS KIND IN THE WORLD!

... And It's Lubricated by Cities Service Pacemaker 400 T Oil!

LAPOINTE MACHINE TOOL COMPANY, originator of the broaching method of cutting metal over 50 years ago, has now originated the first vertical broaching machine with variable speed electro-mechanical drive.

Purpose of the huge, gear-driven machine is to increase tool life up to 500% through smoother operation, thus saving down time and producing more accurate work.

Selection of a lubricant for the new machine was of special importance because of the tremendous pressures it develops: normally 30,000 pounds, sometimes up to 60,000 pounds. Of the many brands of lubricants Lapointe tested, Cities Service Pacemaker 400 T had the necessary requirements for the job . . . so naturally, this superior lubricant got the job.

"We test the machines with Pacemaker 400 T at the factory and then put it in again when the broaches are assembled at the buyer's plant," says Lapointe. "It offers all the characteristics we need: Good film strength, high viscosity index, and exceptional anti-foam and anti-oxidant qualities. Needless to say, we're pleased and impressed with this Cities Service lubricant."

Like scores of others, Lapointe has discovered the search for a proper lubricant ends at the Cities Service label. Altogether, there are hundreds of Cities Service products for the exacting needs of industry. For more information, talk with your nearby Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

Quick Facts About New Broaching Machine

USES: Now used for broaching aircraft engine turbine buckets, but can be adapted to general broaching.

ADVANTAGES: Increases tool life 400-500% through smoother operation, less down time. Produces more accurate work. Variable cutting speed: 12 to 75 FPM. Available in single or double ram models with 72" to 100" stroke.

Quick Facts About Pacemaker 400 T Oil

USES: Propulsion turbine units where oil is circulated under heavy pressure. Widely used in naval and commercial vessels, high speed industrial machinery.

ADVANTAGES: High viscosity index, excellent heat resistance and film strength. Chemically fortified against oxidation, rust, and foaming.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

The Iron Age

SALUTES

H. Thomas Hallowell, Jr. As president of Standard Pressed Steel Co., he is leading the way to standardization in the fastener industry. His personal accomplishments have earned him the presidency of the American Standards Assn.

It takes a man with an unusual amount of persuasiveness, technical know-how and market understanding to bring an industry around to standardizing its products. In H. Thomas Hallowell, Jr., president of Standard Pressed Steel Co., the fastener industry has the man who can do the job.

For 10 years he has been campaigning for acceptance of standard practices at all levels—production, sales, distribution, and consumption. By applying these measures to his own company, SPS' net worth climbed to $20 million last year —16 times higher than in 1940. Hallowell claims lower costs, faster delivery, greater flexibility and safety are the advantages to be found in standard products.

Rarely at a loss for the right word, Tom Hallowell's eloquence has helped attract national attention to his ideas. The road to standardization led to the American Standards Assn., which this year elected Hallowell its president.

A native of Philadelphia—descendant of early Quaker settlers—he was graduated from Swarthmore College in 1929 with a degree in economics. He was an honor student and starred as a football guard and lacrosse player. Standard Pressed Steel was his first and only employer.

During World War II, while directing six separate plants in the Jenkintown, Pa., area, he designed and built a machine for assembling primer heads for shells. The government ordered the machines for all its arsenals. He has a number of other inventions to his credit. Admired and respected by his employees, he received the Industrial Relations Achievement Award from the National Metal Trades Assn. in 1953.

The eldest of his three children, Tom Hallowell, III, is following in the footsteps of his dad at Swarthmore College. The 21-year-old youth was an economics major, a football star and captain of the lacrosse team—a sort of standard Hallowell, you might say.

cold heading profits start here

The quality of the cold heading wire you use is the beginning of higher cold heading profits.

That's why so many users specify J&L Cold Heading Wire to help them get the highest quality finished parts at increased production rates, and lowest manufacturing costs.

J&L Cold Heading Wire will meet your exact requirements for:

Precise Chemical Grade and Physical Characteristics
Surface Qualities
Finish
Uniformity

The result—when you specify J&L, you assure the best heading performance. Investigate the profit-making possibilities of J&L Cold Heading Wire today. It's tops in quality—competitive in price.

Jones & Laughlin
STEEL CORPORATION·PITTSBURGH

J&L STEEL

The Iron Age INTRODUCES

James J. Dunleavy, elected vice president and general manager, Pyrene C-O-Two Divs., **Fyr-Fyter Co.,** Dayton, O.; **Charles S. Duncan,** elected vice president and asst. general manager; **Ralph C. Batch,** elected vice president, production; **Frank B. Allen,** elected vice president and chief engineer.

W. E. Tromanhauser, elected vice president and sales manager, Pyrene C-O-Two Portable Div., **Fyr-Fyter Co.,** Dayton, O.; **Burr Williamson,** named sales manager, C-O-Two Systems Div.; **C. T. DuBreuil,** elected vice president and manager, C-O-Two Systems Div.

Fritz A. Zander, elected executive vice president, **Micrometrical Mfg. Co.,** Ann Arbor, Mich.; **Frank W. Kabat,** named director, sales.

Theodore T. Peck, elected vice president, **Chicago Vitreous Corp.,** Cicero, Ill.

C. A. MacFie, named controller, foreign operations, **Ferro Corp.,** Cleveland.

John B. Cleeves, appointed manager, finance, welding dept., **General Electric Co.,** York, Pa.; **Elton A. Turner,** named manager, finance, Metallurgical Products Dept.

Robert W. Hopewell, appointed manager, field service, **Gould-National Batteries, Inc.,** Trenton.

B. R. Stratton, named manager, Atlanta sales office, **Cutler-Hammer, Inc.,** Milwaukee.

Domenic A. DiTirro, named manager, research and development, **Valvair Corp.,** Akron, O.

Fred T. Chalmers, named asst. manager, Alloy Steel Sales Div., **Republic Steel Corp.,** Massillon, O.

A. J. Hendry, appointed sales manager, Standard Control Div., **Westinghouse Electric Corp.,** Beaver, Pa.

James B. Rafter, named special assistant to manager, Sales Div., **Armco Steel Corp.,** Baltimore, Md.

Robert P. Ogden, appointed general manager, **Industrial Quimica Pennsalt S. A. de C. V.,** subsidiary of Pennsalt International Corp. in Mexico.

Morris W. Porter, named sales manager, Foil Kraft Div., **Kaiser Aluminum & Chemical Corp.,** Chicago.

J. J. Fitzgibbon, named foundry product manager, **Whitehead Metal Products Co., Inc.,** New York; **E. M. Flanagan,** named copper and brass product manager; **C. S. Newmarch,** named stainless steel product manager; **J. T. Stewart,** named welding product manager; **C. H. Swan,** named assistant welding product manager; **T. P. Moore,** named assistant auditor.

HERBERT F. BYRNE, elected vice president, production planning, U. S. Steel Corp., Pittsburgh.

LOUIS J. ROHL, elected vice president and chief metallurgical engineer, U. S. Steel Corp., Pittsburgh.

ROBERT C. SMITH, elected treasurer, Chase Brass & Copper Co., Waterbury, Conn.

LAWRENCE T. PEIFER, appointed administrative vice president, Atkins Saw Div., Borg-Warner Corp., Indianapolis.

the ONLY
PORTABLE NIBBLER *that* CUTS
10 Gauge Steel

Model HN-C for 10 gauge Stainless Steel and 8 gauge Mild Steel. 6" radius.

Without Distortion!

A big statement ... and only Fenway can make it! Our portable Nibblers have solved unusual problems for hundreds of users. Complete line includes the 14 gauge Nibbler and a light-duty 18 gauge Nibbler, and a special 90° head for each.

RCA—DU PONT—GENERAL MOTORS—and many others, use Fenway Portable Nibblers!

PAT. #2278174 #2278311 #2535631

Model MN-C for 14 gauge Stainless Steel and 13 gauge Mild Steel. 1" radius.

ALSO AVAILABLE: CORRUGATED, JIGSAW ASSEMBLY & AIR TOOLS

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MACHINE COMPANY INC.
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Philadelphia 34, Penna.

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William P. Youngquist, named general administrator, production and sales, **Vulcan-Crucible Steel Div.,** Aliquippa, Pa.

Paul N. Gillon, appointed manager, basic research branch, Research Lab., **The Carborundum Co.,** Niagara Falls, N. Y.

Norman E. Eggers, named assistant manager, commercial aircraft sales, Allison Div., **GMC.,** Indianapolis, Ind.

Gary A. May, appointed general manager, Oil Tool Div., **Chicago Pneumatic Tool Co.,** Fort Worth. Tex.

Albert W. McAbee, named manager, Railroad Sales Div., **Inland Steel Co.,** Chicago.

Frank N. Moesta, appointed works auditor, **Mesta Machine Co.,** New Castle plant.

Lloyd M. Steward, named director, quality control, AC Spark Plug Div., **General Motors Corp.,** Flint, Mich.

Byron Snow, named manager, original equipment sales, Ball & Bearing Div., **Hoover Ball & Bearing Co.,** Ann Arbor, Mich.

Joseph Foster, named manager, Market Research Dept., **Brush Electronics Co.,** Cleveland.

Joseph M. Greer, named general manager, production planning, **U. S. Steel Corp.,** Pittsburgh.

Thomas H. Norsen, named sales representative, Buffalo, N. Y., Vulcan Div., **Vulcan-Crucible Steel Div.,** Aliquippa, Pa.

Carl F. Hayden, Kenneth C. Hayden, T. L. Dahlberg, appointed Chicago district representatives, **The Rust Engineering Co.,** Pittsburgh and Birmingham.

John P. Walsh, named sales engineer, **Pittsburgh Engineering Co.,** Glassport, Pa., Div. of Pittsburgh Steel & Foundry Corp.

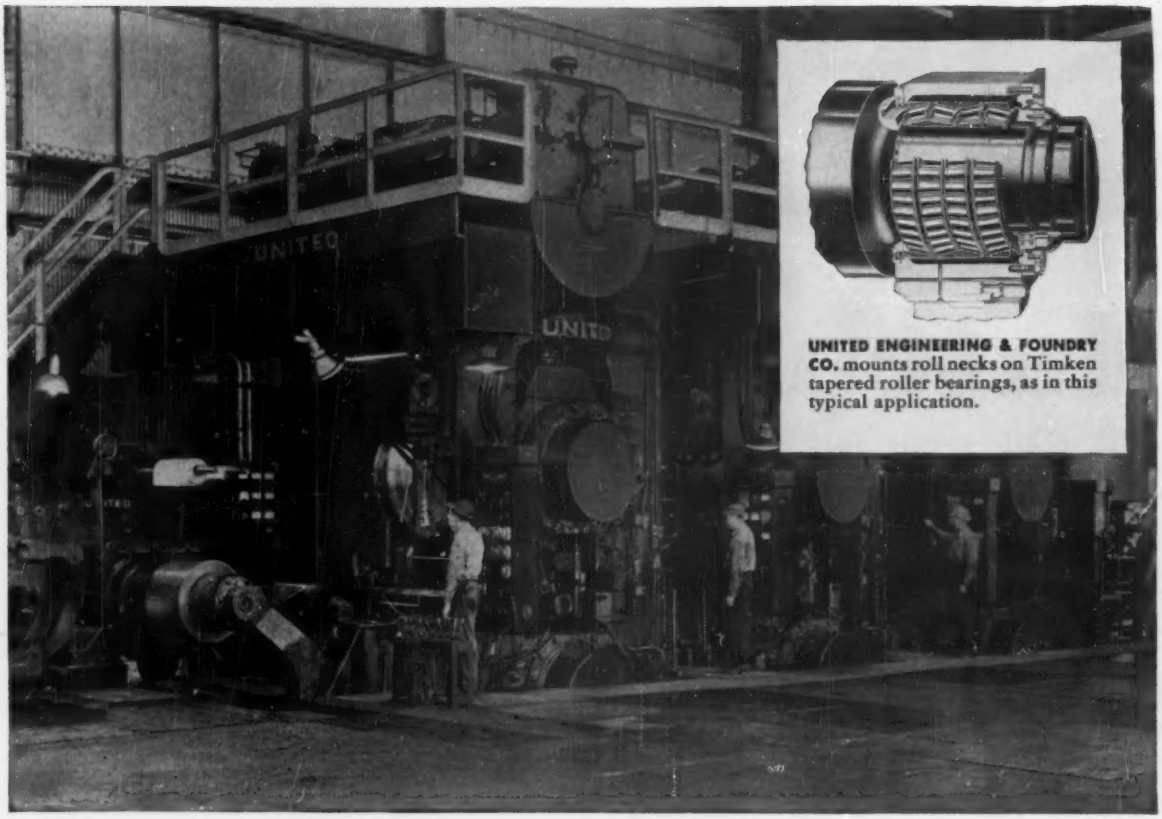
WALLACE I. MARSTELLER, named superintendent, open hearth bloom and billet mills, Republic Steel Corp., Youngstown.

ALFRED A. SMITH, appointed manager, Metal Lath Div., Penn Metal Co., Inc., Parkersburg, W. Va.

H. H. KIECKHEFER, appointed sales manager, Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

KING D. CHRISTOPHER, named general manager, Los Angeles Div., Clark Controller Co.

Crucible Steel gets lower bearing cost per ton...less scrap loss per coil with roll necks on TIMKEN® bearings



UNITED ENGINEERING & FOUNDRY CO. mounts roll necks on Timken tapered roller bearings, as in this typical application.

UNITED ENGINEERING built this 3-stand tandem cold mill for Crucible Steel. Back-up rolls and work rolls are mounted on Timken® tapered roller bearings. By holding rolls rigid, Timken bearings assure "on-gauge" operation, cut costly scrap loss. And the long life of Timken bearings keeps bearing cost per ton of steel rolled to a minimum.

Tapered construction lets Timken bearings take radial and thrust loads. No extra thrust devices are needed. Chuck mountings are simpler, more compact. Timken bearings hold shafts, housings concentric — make closures more effective, with less lubricant leakage. Grease-lubricated Timken bearings require no tubes, pipes or reservoirs, reduce lubrication system maintenance costs. And rolls can be changed faster.

Geometrically designed and precision-made to give true rolling motion, Timken bearings permit easier acceleration, easier driving, which means a saving on power, reduced skidding and scuffing between rolls. Maintenance and repair costs are cut. Mills using balanced proportion Timken bearings increase roll neck strength up to 60% — load ratings up to 40%. The balanced proportion design permits large diameter roll necks without increasing bearing O.D., provides maximum capacity in less space.

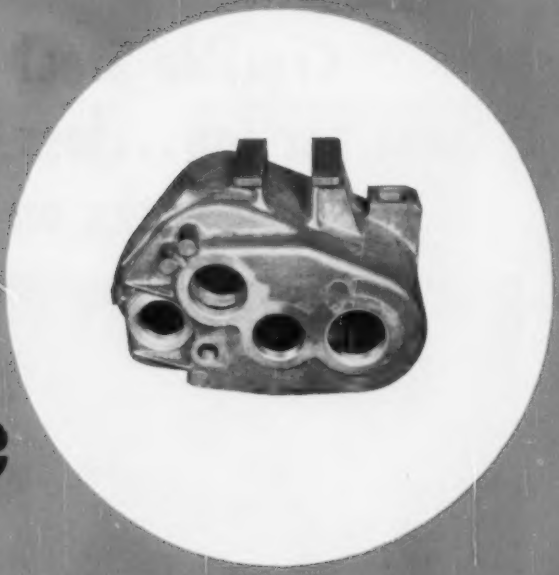
Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

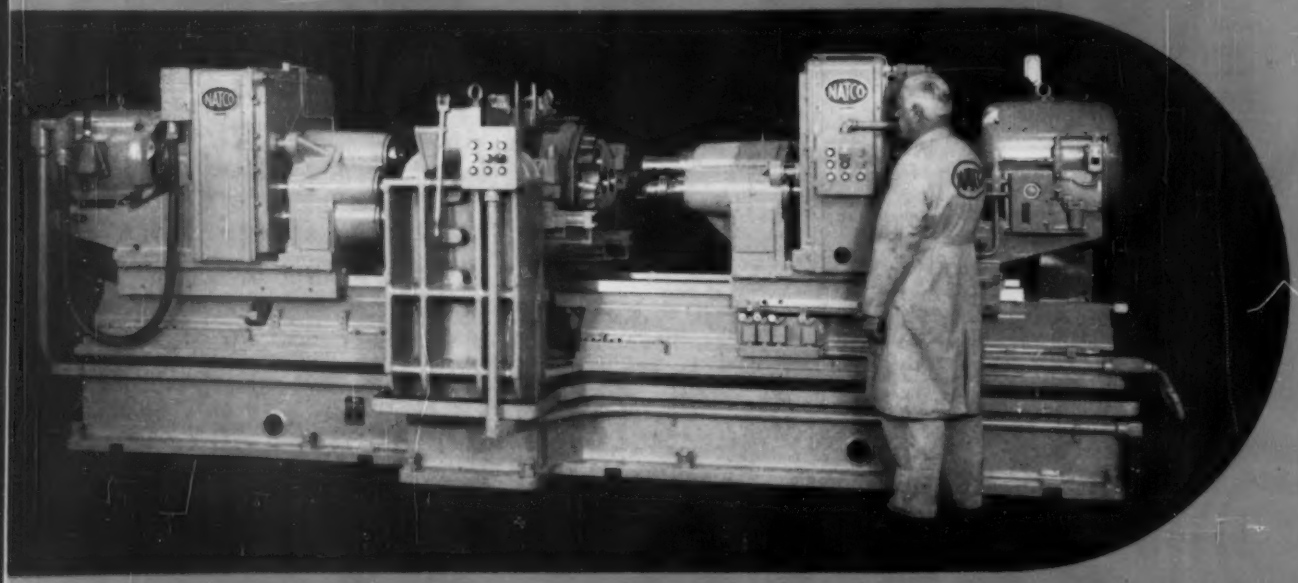
TIMKEN TRADE-MARK REG. U. S. PAT. OFF.

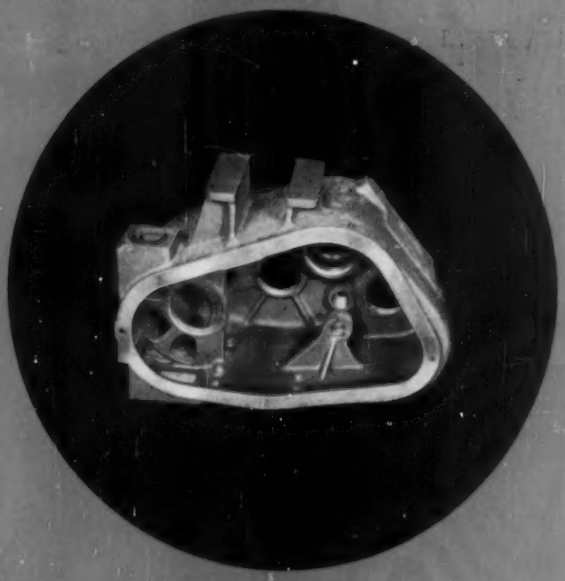
TAPERED ROLLER BEARINGS ROLL THE LOAD

Natco® Automatic Matches Boring Mill Accuracy



and quickly converts for five different jobs





This Natco two-way machine stepped in where automatics "fear to tread!" It replaced a precision boring mill, speeded production and didn't give up a tenth in accuracy! At The Frank G. Hough Co. boring mills were used for exacting tolerances on transmission parts for the Hough Payloader®. Higher production was desired.

Now with a Natco two-way automatic, Hough is getting production rates—not job shop rates. The Natco bores diameters to within .0005"—square with mounting face within .0005" per inch bore length. The machine also chamfers, counterbores and notches boss contours.

Versatile too! Hough processes five different transmission housings or covers with a single machine. After a typical production run averaging 100 parts, the machine is quickly converted to another job.

Ask for information about the PAYD (Pay-As-You-Depreciate) Finance Plan.

National Automatic Tool Company, Inc. *Richmond, Indiana*

Multiple-spindle drilling, boring, facing and tapping machines. Special machines for automatic production.

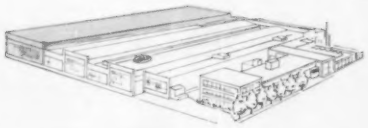
Call Natco offices in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.

NATCO

Notes from Natco...

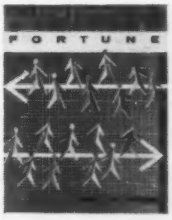
Middle Age Spread

Having reached the age of 55 feeling as spry as the day we started, we at Natco are going to spread out. The demand for our products makes this necessary since we're anxious to give our customers the kind of deliveries they need.



After Jan. 1, 1957, when the job is finished, we'll have eight acres under one roof at our Richmond, Indiana plant. We figure it will increase our production capacity about 50%.

To take care of the increased need for Sales Service, we've already increased our staff about 50% and provided them with new efficient quarters.

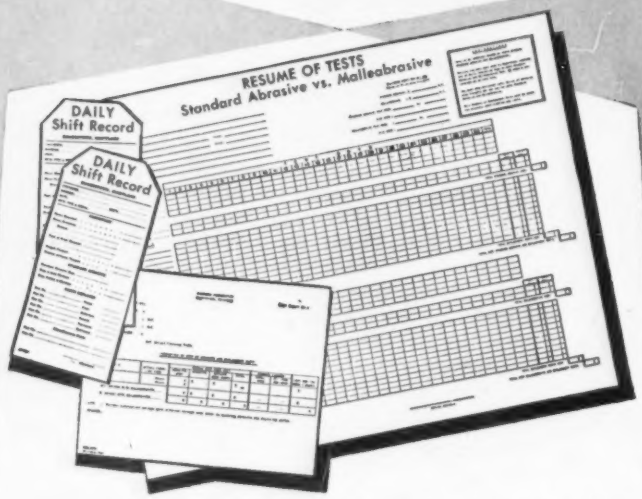


Appreciating Depreciation

Depreciation, we've come to realize, is one of the least understood and most important aspects of the business picture today. Though we're far from experts on the ins and outs of this complex subject, we've undertaken to discuss the importance of looking at depreciation realistically in our current FORTUNE campaign. We'll be happy to send you reprints if you'll drop us a line.

MALLEABRASIVE®

—PUT THE "test" IN testing!



The only real test of any abrasive is its cost per ton of castings —obtained only by completely recorded use in production.

Malleabrasive was the first metal abrasive to be sold on the basis of recorded production performance in user's plants. The fact is, in its early stages of limited production, we sold it only to those who would agree to run recorded comparative tests. Yes, Malleabrasive really "put the test in testing" — really started all of this testing business!

Malleabrasive's economy has since been proven in hundreds of plants, so there are no restrictions on its sale any more. But—we do say, if extravagant claims and gimmick-guarantees are offered you that some other abrasives are cheaper for you than Malleabrasive, the only way to get the facts is to run recorded tests of both materials. Don't depend on generalities.

Samples of the test record forms used to establish Malleabrasive's economy will be sent on request. Write us.

THE GLOBE
STEEL ABRASIVE COMPANY
MANSFIELD, OHIO

Sold and recommended by Pangborn Corp., Hagerstown, Md.

"NOW IN EASY TO HANDLE 50-POUND DOUBLE BURLAP BAGS"

PERSONNEL

Benjamin F. Doty, named welding engineer, **Crucible Steel Co. of America,** Harrison, N. J.; **Walter H. Slinger,** named welding engineer.

Dr. George H. Hickox, named director, research, **Army Corps of Engineers Research & Development Laboratories,** Fort Belvoir, Va.

Harold H. Gillespie, appointed assistant general manager, **The Barden Corp.,** Danbury, Conn.

Weems E. Estelle, appointed manager, engineering, Edison Voicewriter Div., **Thomas A. Edison, Inc.,** West Orange, N. J.

Henry A. Saller, named assistant technical director, **Battelle Institute,** Columbus, O.

J. L. Gabris, appointed assistant general sales manager, Cooking Appliance Controls Div., **Robertshaw-Fulton Controls Co.,** Youngwood, Pa.

Robert K. Johnson, named sales manager, electronic components, Borg Equipment Div., **George W. Borg Corp.,** Janesville, Wis.; **N. W. Alexander,** named factory representative, New York.

William Willis, named engineering manager, **Marman Products Co., Inc.,** Los Angeles, Calif.

Dr. August J. Durelli, appointed professor, Civil Engineering Dept., **Illinois Institute of Technology,** Chicago.

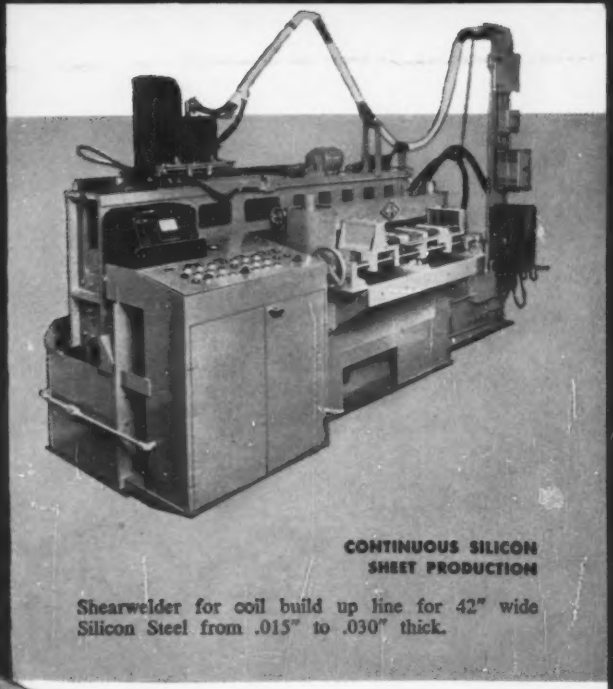
Joseph F. Kerigan, named general manager, Stamping Div., **Chrysler Corp.,** Detroit.

OBITUARIES

Frederic W. Wagner, vice president, **Wagner Bros.,** Highland Park, Mich.

Freas M. Long, 72, retired director, foreign sales, **Gisholt Machine Co.,** Madison, Wis.

THE NEW MPM Shear Welder



CONTINUOUS SILICON SHEET PRODUCTION

Shearwelder for coil build up line for 42" wide Silicon Steel from .015" to .030" thick.

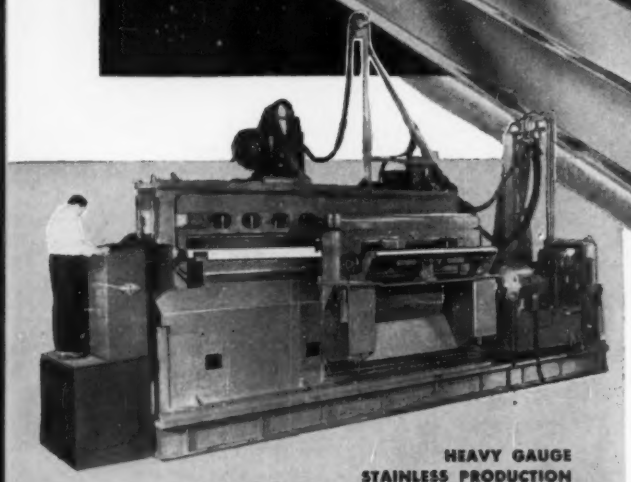
....more automation for even faster Steel Production!

● Metal Processing Machine Company's new Shearwelders are outstanding because of their advanced design incorporating automatically sequenced operations.

Shearing and welding are performed at the same station with positive clamping right at the work area, thereby insuring perfectly aligned butt welds.

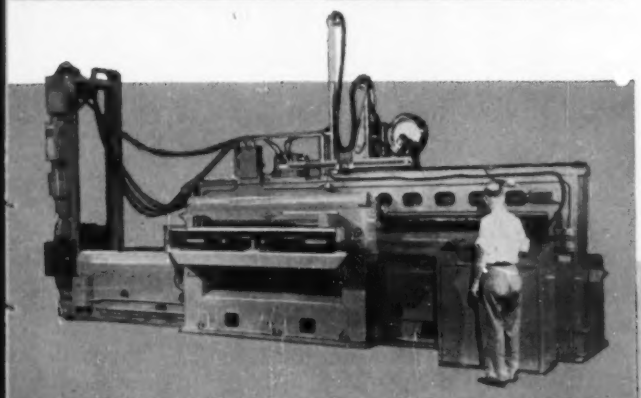
"M.P.M." welds are **extremely ductile,** permitting subsequent rolling, forming, or blanking operations. Weld joints are smooth and require **no trimming.**

Rugged construction is insurance for minimum maintenance and compact design saves floor space.



HEAVY GAUGE STAINLESS PRODUCTION

Shearwelder for butt welding 60" wide x .250" thick Stainless Steel.



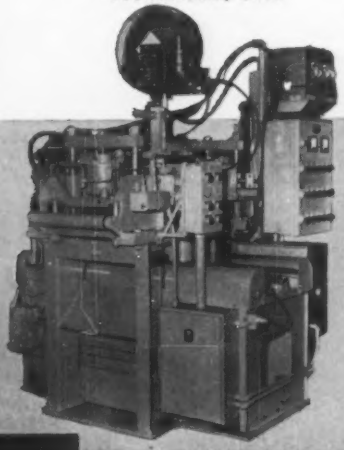
MAJOR COIL BUILD UP

Shearwelder for Carbon Steel coil build up line for .015" to .060" thick x 72" maximum width.

THE METAL PROCESSING MACHINE CO.

DIVISION OF McKAY MACHINE CO.
YOUNGSTOWN, OHIO

McK
MPM



CONTINUOUS TUBE MILL PRODUCTION

Shearwelder used with strip looping device for splicing coil to coil to permit continuous production of tube mill.

10065

Test cuts

by accurate performance of

Photos courtesy
Brown-Wales Company,
Cambridge, Mass.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

eliminated CINCINNATI Shears...

Brown-Wales Company says:

"As a steel warehouse, we have comparatively few production jobs, however, we have found that our men with this new shear can turn out far more work in an hour or a day than they could with the old one. In the first place, the power operated back gauge is a great time-saver when changing, as we frequently do, from one job to another.

"Secondly—the greater accuracy of the shear has made test cuts unnecessary, so that down time between runs is greatly reduced."

Write for Shear Catalog S-7.

The Buttons that save time. The great time-saver—the Cincinnati front controlled Power Back Gauge.

DESIGNERS and BUILDERS of Complete STEEL PLANTS

MESTA

THERE IS NONE BETTER

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Replace tired hands—

Hopper Feeders: Best Bet For Small Plant Automation

• • • By W. G. PATTON, Engineering Editor

◆ "Hopper feeders are the poor man's best bet in the hectic race toward automatic manufacturing." . . . That's the way one plant man describes these simple, yet ingenious, devices . . . But to others, they could make the difference between staying in business and closing the doors for good.

◆ They've already established remarkable production records . . . Output on some existing machines has been jumped 400 pct . . . Their use takes the monotony out of many other jobs and improves overall quality.

◆ IN A TOY manufacturing plant, busy hands had been picking up wheels and axles, placing them in a fixture, then hitting a switch to complete the assembly. In an auto parts plant, these same busy hands had been positioning small components accurately in assembling carburetors. Similar tedious operations go on in plants every day—often for no good reason.

Relatively simple, low-cost devices called hopper feeders take the monotony out of many such jobs. They'll feed small parts of a great variety of shapes and sizes to machines at speeds far in excess of the most deft hands. They do it without getting tired and with far fewer mistakes. Moreover, they'll perform their jobs with a degree of safety that every plant would like to match.

To small firms making products involving many small parts, hopper feeders bridge the gap

between hand-fed operations and fully automatic production. To others, it may mean the difference between staying in business and going out of it under competitive pressures. One plant manager who knows puts it this way: "Hopper feeders are the poor man's best bet in the hectic race toward automatic manufacturing."

Hopper feeders, for the most part, are tailor made for a particular job. Three general types —rotating barrel, vibrating bowl and centerboard—just about cover the entire field. The first two types comprise more than 90 pct of those in use. However, the centerboard type plays a more important role than the figures indicate.

Orients and feeds parts

Probably the oldest in terms of use is the rotating barrel type. It orients and feeds parts uniformly as they are tumbled in a revolving metal drum. Baffle plates in the barrel bring a maximum number of parts into proper feeding position. This type feeder can be used for primary and secondary operations as well as for assembly. They're also used in thread rolling, sorting, positioning, counting, packaging and similar operations.

Among the three types of feeders, the rotating barrel type is probably the fastest. With a "kicker" at the track entry to clear parts away, it'll feed pieces automatically at the rate of 300 per minute through a single track into a thread roller.

For highest production rates, parts should be such as to orient themselves. These are usually quite simple—like a pin with a head or a screw-machined part.

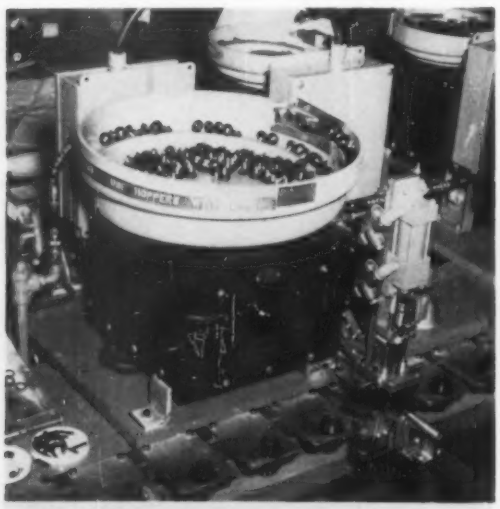
Parts intended for the rotating barrel feeder must be able to withstand the tumbling action.

HOPPER SETUP feeds wheels from side barrels and axles from center barrel in toy assembly.

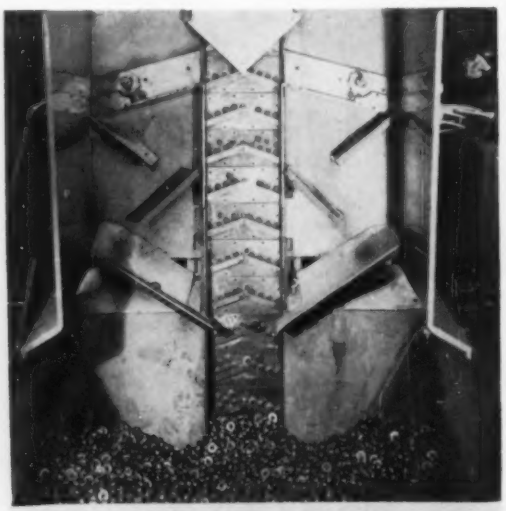
Also, they must not tend to overlap or pile up in the feeder tracks as might occur with thin stampings and washers.

Here's how the rotating barrel feeder works: Dump the parts to be sorted into the rotating barrel. Radial slots or grooves milled in a collector ring can be varied in width to suit the part. For feeding screws or bolts, the slots are cut through the collector ring—preferably with sharp corners for nuts and rounded corners for pins or dowels.

As parts are picked up by the collector ring



VIBRATION induces these parts to move up ramp, toward entrance of track which feeds them evenly to an assembly mechanism.



THIS UNIQUE conveyor-type feeder moves parts to tracks (top left and right) which feed to an engine-head assembly machine.

slots, they're returned by a stationary baffle plate until they reach the entry end of the track. Here, a guard attached to the plate allows properly-positioned parts to pass. It rejects improperly oriented parts which fall back into the barrel.

Adjustable feed-limiting devices prevent jamming and discharge parts at the proper rates. Escapements for doing this are cam-type mechanical units, solenoid-actuated or air-actuated.

It's possible to have many different arrangements of bowls, selectors and feeders, including multiple hoppers for highly automated assembly jobs. On packaging machines, for example, the use of a number of barrel feeders steps up production to exceptionally high levels, yet the floor space required is small.

Vibrating bowl feeders operate on an entirely different principle. High-speed vibration of the bowl (60 times per second) induces the parts to move automatically up a spiral ramp attached to the side of the bowl. Reject devices near the exit assure proper part orientation and orderly feeding. In most installations, track arrangements are about the same as for the rotating barrel feeders.

Feeds up to 300 pieces per minute

The vibrating bowl provides a comparatively simple answer to many feeder problems.

Many common parts, such as No. 14 screws, can be discharged at a feed rate of 300 pieces per minute. It's limited somewhat in the feed rate when handling more intricate shapes such as complex stampings and castings. The more difficult and unusual parts cannot be effectively oriented when conveyed through the selection system at linear feed rates of 40 to 50 feet per minute. The vibrating load level should not exceed 10 to 20 pct of bowl capacity.

The vibrating bowl type feeder has a number of inherent advantages. It has practically no mechanical parts. It's made with just about any size hopper desired although most parts handled are ⅛ to 4 in. in length. Because of its mode of operation, damage to parts is at a minimum.

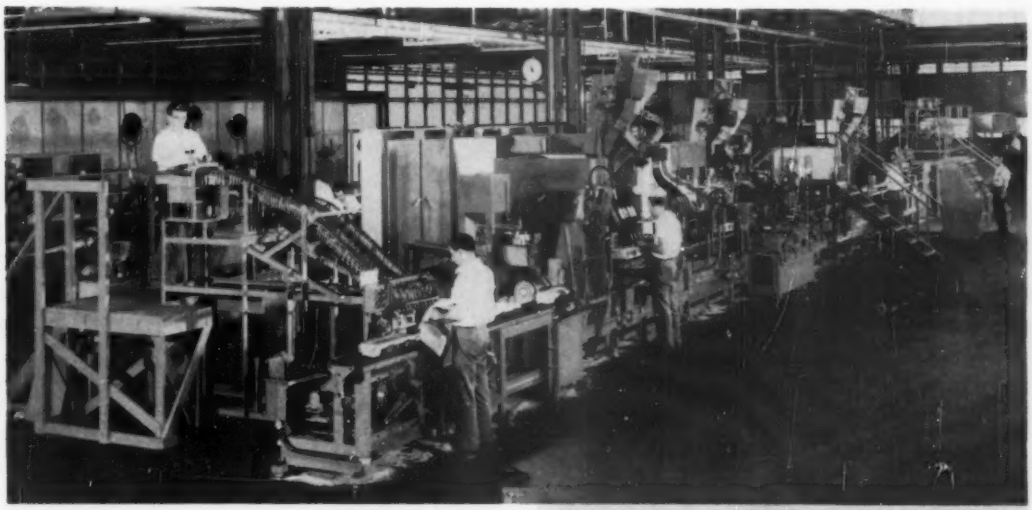
If vibration tends to be noisy, coating with neoprene or some other plastic often provides at least a partial solution. Cost of vibratory feeding is generally lower than by the other methods but the feed rate is often slower than with the rotating hopper.

Don't overlook the centerboard-type hoppers or modifications of it if you're in the market for fast, automatic feeding with a comparatively simple device. They're designed in a variety of arrangements and sizes to suit the needs for each application. The centerboard can be centrally located or placed at the side of the hopper.

As to whether one type hopper feed is better suited than another will depend entirely on the operation itself. It'll help considerably to check with the manufacturers before buying. The education alone is worth it.

You're a potential customer—and beneficiary—of hopper feeders if you're handling rivets, nuts, washers, pins, seals, rollers, balls or similar parts. Other than metals, these feeders will handle glass, fiber and plastic parts. Even delicate objects like porcelain enamel insulators for spark plugs are fed through these devices with very little or no damage.

Hopper feeders are also used to feed presses, centerless grinders, thread rollers and head rollers. Stamping blanks and partially formed stampings are still other parts that can be fed



STRAIGHT-LINE assembly in a high-production setup has been designed around hopper feeders. They took monotony out of job.

"Most parts can be hopper-fed. Some springs, clips, very light stampings are exceptions . . ."

automatically. The list includes many fairly complex parts.

Actually, there aren't too many small parts that can't be hopper fed. Some springs and certain kinds of clips (which may get tangled), and very light-gage stampings and gaskets (when they're too flimsy), are among the occasional exceptions.

The tip-off as to whether you can use hopper feeds to good advantage is when you're running into trouble trying to keep up with growing production needs. Another is when you have a number of tired people trying to make the best of a highly repetitive and tedious job. The chances are that most of your long-run continuous operations will justify the use of hopper feeders. The prospects become even more promising if you're working on a two or three-shift basis.

Assembly is one of the big fields for hopper feeders. But the advantages and savings are just as attractive in thread rolling, automatic screw driving, automatic welding, sorting, gaging, or even packaging where parts have to be counted and handled manually.

Adaptability is one of the outstanding features of hopper feeders. Here's what R. F. Gladfelter, general sales manager, Detroit Power Screwdriver Co., says: "In secondary machining operations, it is possible to use hopper feeds to select and feed the part back automatically into the same machine for a secondary operation."

Boost machine productivity

A very significant advantage of hopper feeders is that they can convert low-production machines to high production. The conversion takes only a short time and relatively small expense. In some cases, output of existing machines has been increased as much as 400 pct—hopper feeders making the difference.

Assuming that hopper feeders can be used in your plant, how will they benefit you? Generally, here's what you can expect to gain: (1) Output rates that will double, and in some cases triple or quadruple, your previous rates, (2) cut down drastically on direct and indirect labor costs, (3) eliminate fatiguing work, (4) boost output for a given floor space, and (5) increase substantially your degree of quality control. But in addition, even if you change your product design, you can still salvage a sizable part of your initial investment.

Let's take the case of the toy manufacturer whose operators fed wheels and axles into a double locating fixture manually. There were 50 such operators performing this tedious job. Now two hopper-fed machines pre-select wheels and feed them automatically. At the same time, a third hopper feeds the axles. Not only has the conversion removed the monotony from the job, but the assembly rate has jumped to about 60 per minute.

A similar pattern repeats itself with lock subassemblies, cabinet hinges, plus a host of other products. Even the screws are counted and dropped into the package automatically.

Hopper selection primarily boils down to (1) the type most efficient for your particular work and (2) the method which offers the greatest saving. But don't overlook other important considerations. One requirement for automatic feeding is that the parts be uniform. With most hopper-fed parts, certain dimensions can vary by as much as 0.020 to 0.030 in. In other cases, a dimensional variation of 0.003 to 0.004 in. can cause trouble.

Design change can simplify feeding

In the case of pins or plugs having the same length and width, very critical selecting devices generally must be used with rotating hopper feeders. Often, only a slight dimensional change, which will not affect performance, will greatly simplify feeding.

Sometimes, proper orientation of parts becomes difficult. If this is a problem, you may have to resort to special gap-type tracks, periphery types of selectors or other such devices.

Burrs tend to interfere with feeding. They'll also cause excessive wear. Tumbling or some other deburring method may be less costly in the long run than feeding the parts without deburring. Also, keep your dies sharp and your tolerances tight.

The AC Spark Plug Div. of General Motors Corp. serves as a good example of what can be done with hopper feeders. It took a young engineer, assigned him to a plant-wide survey for the purpose of suggesting every possible use for hopper feeders. The most promising applications were taken first. This activity paid for itself several times over in the first year. It's now part of a continuing program.

ACKNOWLEDGMENTS

■ The Iron Age is indebted to many sources for the material in this article. While it would be impossible to acknowledge all the help received, it is particularly indebted to the AC Spark Plug Div. of General Motors Corp., Detroit Power Screwdriver Corp., Chrysler Corp., Plymouth Div. of Chrysler Corp., Ford Motor Co., General Motors Process Development, Inter-Lakes Engineering Co., and Syntron Co.

■ *Reprints of the article are available as long as the supply lasts. You may obtain a copy from Readers Service Dept.,* THE IRON AGE, *Chestnut & 56th Sts., Philadelphia 39, Pa.*

Save wheel swarf—

Reclaimed Diamonds Help Pay Grinding Costs

◆ SWARF from grinders can have salvage value. Segregated and sold for réclamation, diamond-bearing swarf sometimes repays up to one-half the cost of the industrial diamonds originally embedded in your grinding wheels. Value may approach five dollars per dry pound of swarf.

Some reclaimers currently pay up to $1.80 per carat of diamonds recovered. Dry diamond swarf usually yields at least 200 carats per 100-lb shipment. Over a relatively short period, this financial return can help cut diamond grinding costs substantially.

Reclaimed diamonds possess all characteristics of the originals, save size. Usually they average smaller, probably due to fracture in grinding.

Segregation keynotes economical diamond recovery. If other abrasive dust dilutes the diamond swarf excessively, it's simply not worth salvaging. At least one reclaimer offers to analyze 2-lb samples to determine anticipated diamond return per pound. The same firm will suggest means of increasing diamond recovery if requested.

When using only diamond wheels, there's normally no segregation problem. Recovery equipment usually costs little, particularly if shop-built. Properly used, it will return the investment in a short time.

Separate swarf

In dry grinding, individual dust collectors are preferred. Locate them at each grinder or battery of grinders working with diamond wheels (Fig. 1). Such collectors may employ paper, cloth, spun glass or electrostatic separators. Major requirement is periodic dust removal to maintain exhaust efficiency.

In wet grinding, collect diamond sludge in a settling tank. Allow to stand undisturbed for several days, then decant water or coolant. When dry, store for shipment.

In exclusively diamond wheel installations, avoid mixing swarf ground from workpieces of one material with that ground from another. Norton Co., Worcester, Mass., finds swarf from carbide grinding one of the most fertile sources of reclaimable diamonds. This can point toward the tool crib as an area rich in diamond swarf, if you sharpen and reface carbide-tipped cutting tools there.

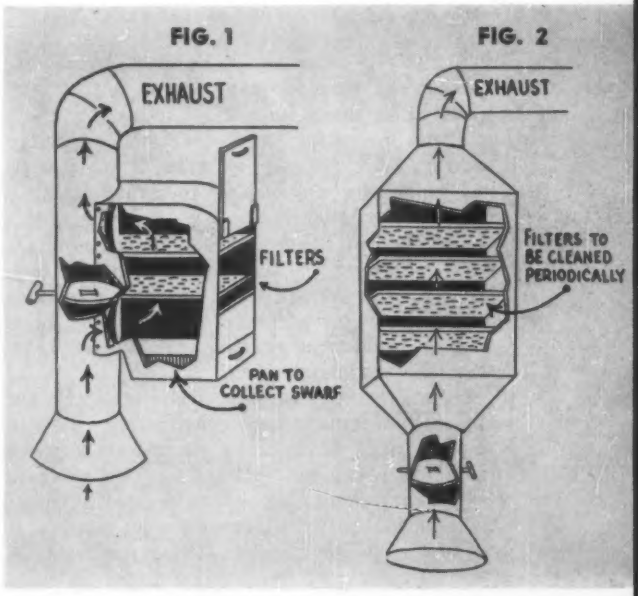
Mixed swarf presents a special situation. Usually this comes up when a machine grinds with diamond wheels at one point, with aluminum oxide or silicon carbide wheels at another. It's necessary to separate diamond swarf from that produced on wheels of different abrasive material.

Normally, this isn't troublesome. When collecting swarf at individual machines, simply switch to a new filter bag when changing over to a diamond wheel. Filter setups in central exhaust systems should incorporate a by-pass (Fig. 2). Draw off dust through the by-pass filters only when grinding with diamond wheels.

In shipping diamond swarf, remember the reclaimer's interest lies only in recoverable diamonds. You don't receive credit for water or moisture in swarf. Shipping dry dust also holds down transportation costs.

Forward diamond wheel stubs separately, since a different reclaiming process is used. Label all shipments "refuse material" for lowest shipping costs.

Try to accumulate at least 100 lb of swarf before shipping. Reclaimers accept smaller shipments, but usually give higher salvage value on larger amounts. This can mean storing swarf three to six months or longer. But the rate per reclaimed carat can run more than twice as much in 100-lb lots as in less-than-50-lb batches.



No silicosis—

Treated Silica Brick Eliminates Dust

By C. E. CLINE, Superintendent, Masonry Dept.

R. A. BLOOM, Research Metallurgist, The Timken Roller Bearing Co., Canton, O.

◆ In some industries, silicosis continues as a potential hazard to workers' health . . . Casters, steelmakers and refractory producers know this and watch for every sign of air-borne silica, whether dusted from sand or brick.

◆ One steelmaker found a simple, inexpensive solution—that of using treated brick to prevent dusting . . . This, along with other controls, gives this firm an admirably low incidence of silicosis.

◆ SILICOSIS as an industrial health hazard has been on the wane for many years. But it's still a plague in many industries, and a particular problem in casting, and steel and refractory making. Even in these industries, new materials and techniques are helping to reduce its incidence to negligible levels.

The Timken Roller Bearing Co., Canton, O., has the problem well controlled—so well, in fact, that silicosis is virtually a thing of the past. One of the many measures taken solved the silica dusting problem associated with furnace construction and maintenance.

Silica brick is used extensively in electric arc and open-hearth furnace construction. Timken employs silica brick in its electric arc furnace roofs. It has given satisfactory service there for many years. Also, it has created a potentially serious situation arising from silica dust evolved in handling and installing the brick.

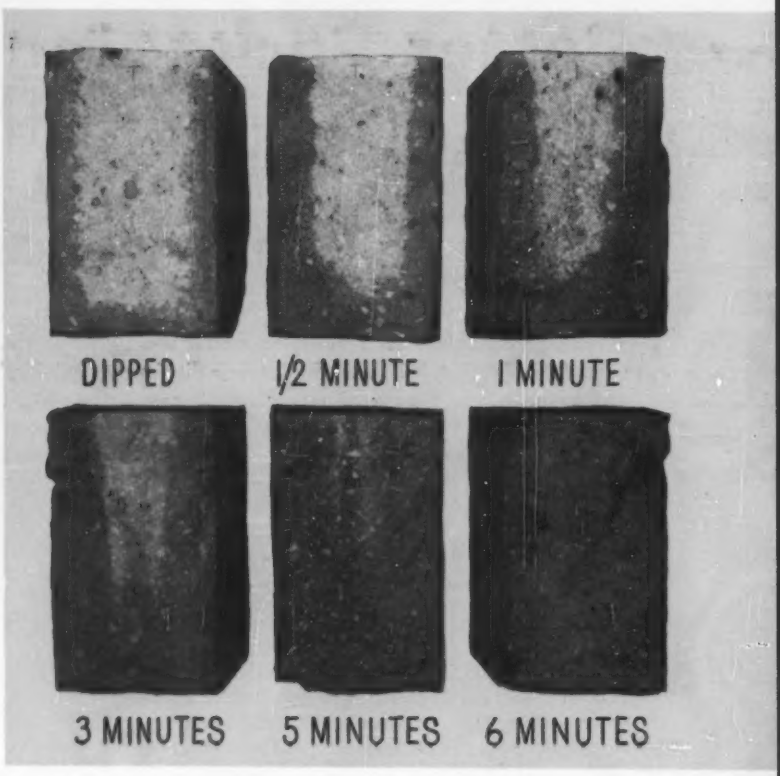
Silica brick roof construction formerly called for much on-the-spot hand cutting or shaping. While convenient, this constituted a major source of silica dust. Development of special brick shapes, and carrying out necessary brick cutting and sawing in an enclosed vented chamber, greatly eased the situation.

But dust from handling silica brick in unloading, stacking and laying-up still remained a serious problem.

Concern with this harmful refractory dust concentration led to investigation of surface treated silica brick. Several processes can bind loose particles to the brick surface, and thus prevent dusting. For the treatment to be feasible, process must be inexpensive, simple to apply and non-injurious to refractory brick properties. Some of the materials considered as dust inhibitors include: paint, plastic coatings, oil, sugar solutions, and water solutions of dry binders.

On testing each possibility, all treatments appeared to decrease or eliminate visual evidence

(Above) **SILICA BRICK** is cut and shaped in an enclosed, vented chamber to help reduce air-borne dust.



(Right) **QUARTER - SECTIONS** of silica brick show rate of dip penetration. Spray treatment may suffice.

of dusting. Treated bricks also passed dust-inducing abrasion and impact tests, such as met in service.

Paint and plastic coatings were discarded. They were found too involved and expensive. Oil was abandoned because of complications resulting from its oily surface.

Water solutions of dry binders effectively eliminated dust arising from impact and abrasion. Of the dry binders tested, the ammonium lignosulfonates appeared the most promising since they are (1) inexpensive and readily available, (2) water soluble without disagreeable odor, (3) applied easily by immersion or spray, and (4) rapid drying, and form a resinous coating.

No more dusting

Laboratory tests demonstrated effectiveness of this treatment in eliminating visual evidence of dusting. Further tests verified that materials used as binders do not affect the refractoriness of the brick. These last tests included the ASTM pyrometric cone equivalent test, a measure of the relative refractoriness of a material.

On transferring laboratory findings to production situations, workers found no visible dust on handling the treated brick in furnace roof construction. Furthermore, treated brick once in service could not be distinguished from untreated brick.

Full pallets of bricks are now dip-treated without restacking or special handling. An accompanying illustration shows brick cross-sections and depth of penetration.

Procedure for preparing the lignosulfonate solution simply involves adding 1-lb powder to each gallon of water. Mix with air agitation. Use an anti-foam agent to kill the sudsy blanket that forms in mixing.

On dipping, the lignosulfonate solution penetrates the brick surface, and dries rapidly by absorption. The resinous film thus formed binds loose particles of the brick together.

Since initial plant trials, treated silica brick has been specified in construction of over 50 electric arc furnace roofs. Bricklayers report complete absence of dust from treated brick. Service records on these roofs show the brick treatment has not shortened roof life.

Immersing the brick consumes more solution than actually needed to stop dusting. Surface penetration only a fraction that obtained from dipping would effectively inhibit dust formation. Spraying the solution on the refractory by the manufacturer should be more efficient. This could benefit both manufacturers and consumers of silica refractories.

Better Packaging Stems From Simple Ideas

◆ Packaging products costs money no matter who ultimately foots the bill . . . Whether you dismiss packaging as a necessary evil or cultivate it as a fertile area for cost-cutting, it figures in . . . If you ignore it, your competitor won't.

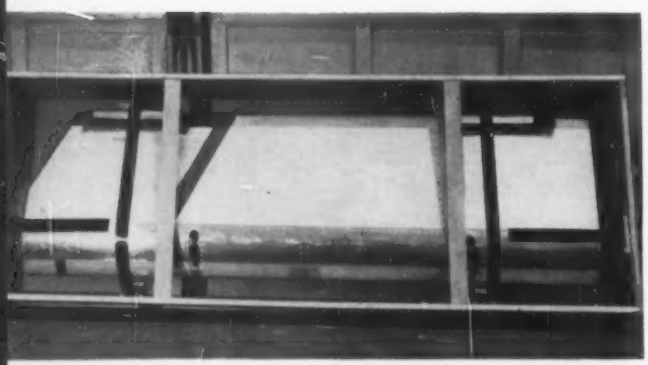
◆ North American Aviation has taken some simple but highly effective swipes at cutting packaging costs . . . These three ideas alone—spring steel fasteners, modular packaging, tape suspension—saved thousands . . . All are broadly adaptable.

By H. H. LAMAR, Supervisor, Material and Process
North American Aviation, Inc., Los Angeles

◆ PACKAGING is admittedly a necessary function in making and shipping a product. But too often—since the customer eventually pays the cost—packaging is dismissed without any great attention to how its cost might be reduced.

This thinking won't do anymore. Today, too many plants schooled in this kind of thinking are losing ground to their more alert competitors; those who see in packaging attractive opportunities for saving time, money, labor and materials.

North American Aviation, Inc., Los Angeles, is one such packaging-minded firm. Its efforts to expedite packaging and trim costs have resulted in several ideas, devices and methods which are already saving thousands of dollars a year. Moreover, they're broadly applicable to other industries. Samples include a spring-steel fastener with 30 times the holding power of a nail; modular packaging, which brings mass production methods to shipping problems; and tape methods for securing fragile goods.



FRAGILE, contoured parts like this aircraft aileron ship safely, secured by tape suspensions like these. On this application, tape method cost $4, against $18 for previous bag suspension.

A new type corrugated container has also been developed. North American now has a series of experiments under way to save the Air Force huge sums each year by using commercial instead of military packing, and bonding shredded corrugated scrap into a useful material.

The fastener, an L-shaped clamp of steel spring, was dubbed the Klimp. It was devised to substitute for nails in fastening together cleated panel boxes.

The Klimp offers several advantages. It's easily applied. It can be used over and over again. Since it does not damage the wood, it permits shippers to re-use containers many times. Currently, cleated panel boxes of the type used to ship refrigerators and other hard goods are seldom re-usable because of damage done in removing nails when they are opened.

The time required for nailing shut cleated panel boxes is halved with the device, the company estimates. The containers can be opened in one-fifth the time taken to open them with a nail puller. A simple hand tool with a wedge-shaped head, also North-American developed, is used for tapping on and removing the fasteners.

Modular packaging, another innovation, was an idea originated at Northrop Aircraft, Inc., about two years ago. It was adopted by North American's packaging research group early in 1955.

Briefly described, modular packaging consists of the making of identical panels in 3-in. increments. These are fitted together in groups of three different pairs to make any one of 40 or 50 of the most widely used sizes of boxes. With panels already cut, the shipping department can

CLEATED PANEL BOXES shut in half the time, reopen in one-fifth the time, hold 30 times tighter than with nails, using these spring steel fasteners. Both boxes, clips are reusable.

CORRUGATED WASTE bales up into this inexpensive bonded, shredded, corrugated material, useful for insulation, soundproofing, other purposes. Flask holds the liquid bonding agent used.

quickly assemble a box to hold almost any shape or size item it wishes to dispatch, merely by fastening the proper panels together with nails or with the Klimp fasteners.

Modular packaging offers advantages of a long buy, expert standardization of material, less setup time and of mass production, which provides custom sizes far more cheaply than boxes purchased individually. But it's economical, the company emphasizes only for companies doing a large volume of shipping.

Another benefit, from a planning point of view, is that the method permits a manufacturer to estimate how many panels are needed per quarter on the basis of past usage.

North American now makes up its own panels from material purchased elsewhere. But the company hopes that box manufacturers will adopt the idea and furnish customers a wide variety of ready-made panels in various sizes, to lessen costs still further.

Tape suspends parts

Another problem many manufacturers are up against is that of shipping fragile goods with contoured surfaces. One such item at North American involves ailerons on the F-86D Sabre Jet. For this problem, the company developed a means for suspending the ailerons in a box with a reinforced, pressure sensitive tape. This way of packaging takes the load from the part as sheer and transmits it as tension.

Started about a year ago, tape suspension provides an engineered package, since the exact number of tape strips, their location and their necessary strength can be calculated. It provides a reduction in weight and volume and a significant reduction in cost of packaging—actually about 50 pct.

Previously, North American shipped its fragile aircraft parts by suspending their ends in canvas bags fastened by straps to the sides of the shipping container.

This method was started four or five years ago. It had two disadvantages: In the first place, it was expensive. In the second, it took the weight in bearing, not in sheer.

Packaging an F-86D Sabre Jet aileron in bags once cost about $18 for labor and materials. With tape suspension, this cost has been reduced to $4. The tape is weather-resistant, has a very low hot and cold flow, and can take an ultimate load of 980 lb in tension.

The company's tape hold-down system is a variation of tape suspension, applicable to parts having at least one flat surface. This flat surface rests in a stable position on the inside of the container's top panel. Tape hold-down is about 60 pct less expensive than other available methods. The part is not as completely protected, but damage in transit has been relatively negligible so far.

Changing one single type of corrugated container, in another instance, cut packaging costs considerably. The size of an ordinary file drawer, this container was redesigned to be held together with four small, flat metal clips, rather than with gummed tape. Clips can be removed in a few seconds, and the re-usable box unfolds and spreads flat for easy storage. Savings add up to $5,000 a quarter on this item alone.

Another promising development is a method for shredding, pressing, bonding and baling corrugated scrap into different thicknesses. These are useful as insulation, soundproofing and padding. The company generates 10 tons of shredded corrugated a week and sells it for practically nothing, as things now stand.

Save time, money—

Russians Hot Roll Gears on Production Mill

◆ Gears of many types are rolled hot on a production mill in Moscow's Red Metal Worker plant . . . Finished products are reportedly made stronger, faster, at less cost than conventional milled gears.

◆ Spur gears are made by hot rolling teeth in long billets, then slicing off gears like sausage pieces . . . Other forms are produced by rotating single blanks in conjunction with radially-fed rolls.

By A. J. STEIGER, New York

◆ RUSSIAN DESIGNERS have developed a mill for hot rolling cog wheels and spur gears that can replace the conventional gear milling machine, according to a recent report in the Soviet journal, Vestnik Maschinostroeniye (Machine-Building Herald).

The gear rolling mill not only eliminates metal cutting in the shaping of gear teeth, but is also said to produce stronger gears faster and at less cost.

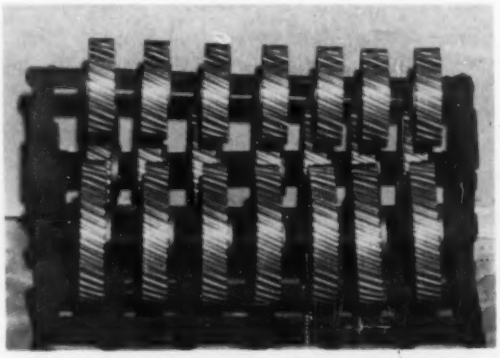
First operating unit for hot rolling gears was installed at Moscow's Krasnyy Metallist (Red Metal Worker) plant in 1952. Without specifying exact sizes, the report indicates that the mill is designed for rolling spur gears with pitch circle diameters to 220 mm (8.66 in.) and modules to 3 mm (0.12 in.)

Another model was built more recently and installed at the Chelyabinsk tractor plant in the Urals. Designed to hot roll cog wheels with diameters up to 600 mm (23.62 in.) and modules up to 10 mm (0.394 in.), it is currently undergoing trial runs.

As shown in Fig. 1, reproduced from the Russian journal, the roll stand features guide screws (1) of large diameter with right and left threads. Along these travel two carriages (2) on which vertical rolls (3) are erected. Guide screws are turned by a separate motor (4) through the cylindrical worm reduction gear (5).

Depending on the direction in which the guide screws turn, the carriages can be simultaneously brought up to or withdrawn from the billet which is fixed in the clamping mechanism or rest (6). Rotation is transmitted to the rolls through cylindrical gears (not shown in the drawing) that slide along the transmission shaft (7). The cylindrical gears mesh with pinions (8) and bevel gears (9).

As shown in Fig. 2 (also reproduced from the Russian publication), the transmission shaft rotates the dividing mechanism through a pair



HELICAL gear forms are rolled in heated billets which are later sectioned into separate gears.

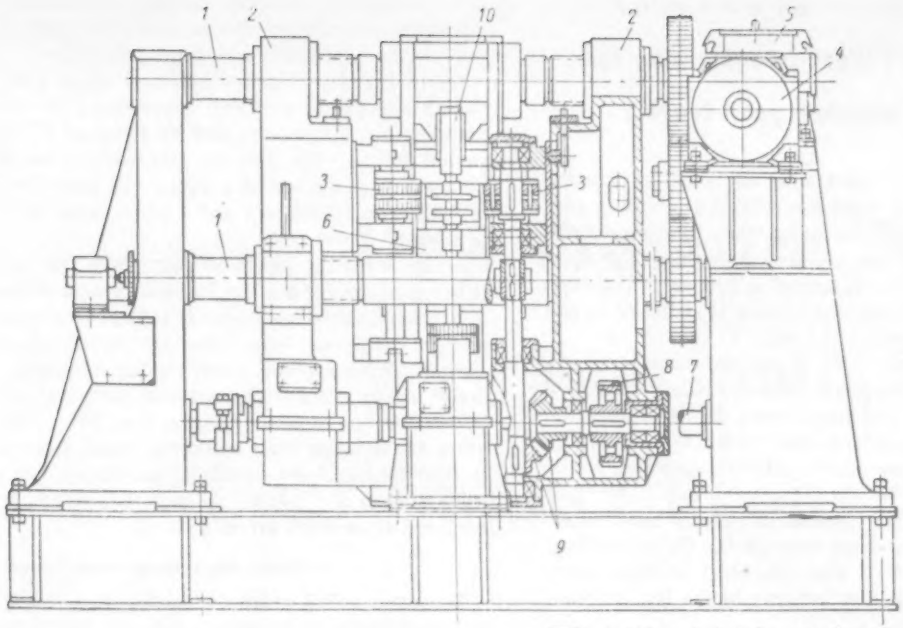
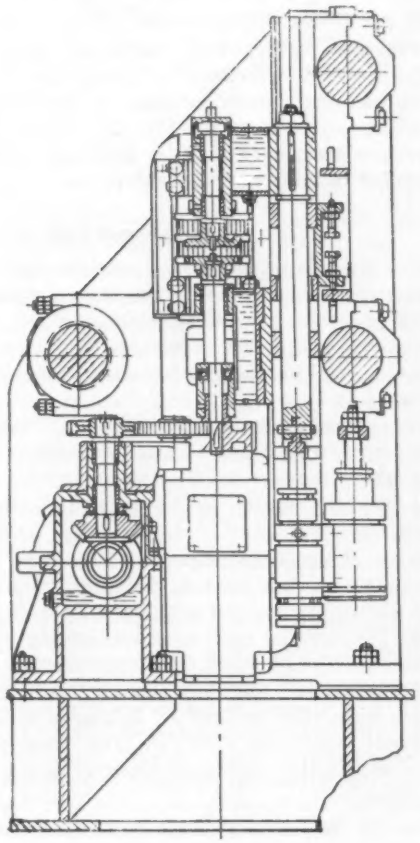


FIG. 1 (Above) Article text describes functions of numbered parts in this view of the roll stand.

FIG. 2 (Below) Cross section of roll stand which forms gears hot by either of two production methods.



of bevel gears. A special coupling on the transmission shaft provides for angle adjustment of the rolls. Power for the mill's 18.5-hp motor is supplied by a motor-generator set. This allows smooth regulation of roll speed from 20 to 60 rpm and also permits fast reversal. Automatic roll reversing after a given number of revolutions is a motor control feature which aids proper shaping of gear teeth.

Roll-feed can be graduated from 0.04 to 1.00 mm (0.0016 to 0.0394 in.) for each halfturn of the billet. An automatic device stops the feed mechanism when the rolls approach a predetermined point.

Choice of two methods

The roll stand is equipped with a high frequency current unit for heating the billet when it is clamped in the rest.

Gears can be hot rolled by either of two methods: (1) round-bar rolling, whereby the billet is fed axially, and (2) piece rolling, in which rolls feed radially.

In the axial feed method, a billet, a set of gear blanks or a blank bar is centered in the rest. Top center of the rest is combined with a dividing gear that has the same number of teeth and module as the gear being rolled.

When rolling starts, the billet is set up so that

"Bevel sections (on work rolls) do the main work in deforming the billet and shaping gear teeth . . ."

its top face is level with an induction heating ring arranged under the rolls. The dividing gear is engaged with the rolls; when they start turning the billet also rotates. As soon as the front end of the billet is heated to proper rolling temperature, the feed mechanism is switched in and the billet passes to the rolls.

The working rolls at the intake section are beveled for ease in gripping the billet. This bevel section does the main work in deforming the billet and in shaping gear teeth. Final grooving of teeth is done on the cylindrical section of the rolls.

Billet feed is regulated so that the metal heats uniformly as it rises through the induction ring. At the top of its rise, the billet is taken from the rest which then returns to the bottom position.

Distance between the axes of the rolls is fixed in accordance with the diameter of the gear to be rolled, and is not changed during the process. Original billet length is a multiple of the number of gears required plus an allowance for cutting off individual gear sections. However, when a stack of gear blanks is rolled, cutting is not necessary. This axial feed method is suitable only for rolling straight-tooth and spiral gears.

For piece rolling with radial roll feed, the billet is placed in the bottom driving table of the work rest and clamped in place by the movable head above it (item 10, Fig. 1). When their carriages are moved in, rolls plastically deform the billet metal to desired tooth shape.

Billet and rolls rotate

The billet is heated by an induction unit arranged between the rolls. For initial heating, billet and rolls are rotated with the roll feed mechanism motionless. When operating temperature is reached, the roll-feeding mechanism is switched in.

This second method can be used for rolling the following types of gears: straight, spiral, herringbone without a middle groove, herringbone with any number of tooth bends, and cluster gears.

Teeth of rolled gears produced by these two techniques are not machine finished. In profile they are usually covered with a fine layer of iron oxide (Fe_3O_4) and have a smooth surface typical of rolled sheet metal. To avert profuse mill cinder formation, the billet heating temperature ranges from 1920° to 2000°F. Rolling is finished between 1560° and 1740°F. After they cool, gears are checked for pitch diameter and tooth thickness.

Due to the comparatively high accuracy of outer diameters produced by gear rolling, the circumference around the tops of the teeth is used as the base for reboring the inner hole.

Gears found within the limits of Class 3 accuracy are passed for final processing; the remainder are either scrapped or returned for a second rolling. By Russian standards, Class 3 accuracy is described as a radial rim beat limit of 0.080 mm (0.003 in.) and a pitch error limit of 0.1 mm (0.004 in.).

Scrap is usually produced only while the mill is being set up for a given batch of gears. Some dimensional variations occur as rolls get warmer, and to counteract this, rolls are moved apart slightly. With constant water cooling, rolls eventually attain a practically-constant temperature.

The Russian journal reports that hot rolled gears are stronger than machined types. Reason is that rolling flows metal in accordance with tooth profiles and avoids the cross-cut structure produced when teeth are milled.

Show high wear resistance

Moreover, rolled gears are highly wear resistant to a depth of 0.5 mm to 0.6 mm (0.019 to 0.024 in.) below the tooth surface. Results of 1000-hour wear tests on rolled and machined gears definitely favor the rolled variety.

Special impact fatigue tests were made on tooth surfaces of gears rolled initially from Russian steel 45, then milled to remove a surface layer 0.15 mm (0.006 in.) thick. Results established fatigue limit as 70 kg per sq mm (99,400 psi). For milled gears of the same grade of steel, this limit was found to be 53 kg per sq mm (75,300 psi).

The rolled gears are used in the speed reducers of electric drills produced at the Red Metal Worker plant. Tests show them to be less noisy than the milled gears used previously.

Working rolls on the new equipment have the same modules as the gears they form and are made on conventional gear-cutting machines. After machining, rolls are case-hardened to a depth of 0.5 to 1.0 mm (0.019 to 0.039 in.) and then tempered.

Such rolls normally produce 3000 to 5000 gears. The Moscow plant says the usual hobbing cutter will cut only 900 gears of the same size.

Report also observes that pitch diameter errors made in milling the working rolls average out during the gear rolling process, and that finished gears show uniform pitch.

Mill in production at the Moscow plant is also used to experiment with single-piece operations in rolling cog wheels with modules up to 6.0 mm (0.236 in.). It has already made good quality gears with modules of 4.0 mm (0.157 in.). Remodelling is underway to adapt the mill for rolling gears with diameters ranging from 40 mm (1.57 in.) to 370 mm (14.57 in.).

In addition to gears, the mill can produce rollers with trapezoidal spiral threads of large scale. A practical application has not yet been found for making screws in this manner.

In low alloy steels—

How Fracture Type, Specimen Size Affect Impact Properties

◆ Fracture type provides significant clues to steel impact properties . . . In martensitic structures, both ductile and brittle fractures can frequently be traced to tempering temperature.

◆ Effect of specimen size is generally more pronounced at higher hardnesses . . . It's a factor that should be understood in evaluating impact properties.

PART III

By H. SCHWARTZBART, Supervisor, Welding Research, and J. P. SHEEHAN, Supervisor, Armour Research Foundation, Illinois Institute of Technology, Chicago

◆ BRITTLENESS revealed by the impact test may have entirely different structural origins in a steel and yet look the same. With the exception of temper-embrittled martensite, little is known of the relation between the microstructure of the tempered martensite and the features of the fracture that are responsible for the macroscopic brittle appearance.

For this reason, impact fractures of tempered martensite were examined to determine microscopically the features that constituted their macroscopically brittle character.

Specimens were sectioned normal to the fracture surface and examined along the path of the fracture. All specimens were plated with nickel. This procedure protected the fracture during preparation of the metallographic section. Additional studies were made to compare microscopic rating of percent brittleness with macroscopic estimates of brittle fracture.

The brittle fracture ratings for the various tempered martensites and testing temperatures are shown in Table I.

Microscopic data were obtained by observations through a No. 5 grid Bausch and Lomb grain-size eyepiece. The percent brittleness was estimated for each field across the fracture from the notch to the bottom of the specimen. Observations were made at magnifications of 150 to 300x, depending upon the structures involved.

Brittleness was arbitrarily defined as cleavages or straight fracture partings. Torn or irregular fracture paths were considered ductile.

Microscopic evaluation of per cent brittle fracture reveals characteristic changes corresponding more closely to energy changes than the macroscopic rating of the fracture. In the A-brittleness region, microscopic rating of specimens

■ Last of a three-part series, this article is based on one of the most comprehensive programs on the impact properties of low alloy steels ever conducted. Sponsored by the Office of Naval Research, the program required years of intensified research for its completion. Previous installments, dealing with the effects of boron and rare earth additions, grain size, and other basic variables, appeared in the issues of August 9 and 16.

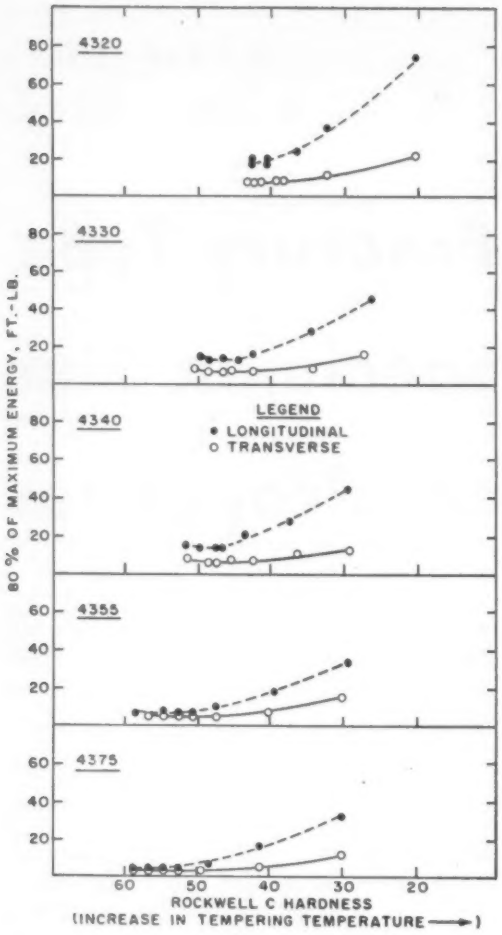


FIG. 1—Effect of specimen orientation on 80 pct of maximum energy values in 4300 steels.

tempered at 500°F, and broken in the transition range, showed 87, 49, and 18 pct brittle fracture from low- to high-testing temperature. This is to be compared with micro brittle ratings of 51, 11, and 4 pct for specimens tempered at 400°F.

In 100 pct brittle fractures, the relation of fracture path to steel structure depends upon the tempering treatment that has been given to the martensite. The fractures show a progression from transgranular fracture after tempering at 400°F, to intergranular after tempering at 500°F, and again to transgranular after tempering at 1200°F.

Tempering affects fracture

Transgranular and intergranular refer to the austenite grains present just prior to quenching, not to the derived ferrite grain structure of the tempered martensite.

A further observation was made in the case of the intergranular path of 100 pct brittle fractures in the A-brittleness range. Not only was the main fracture path predominantly along grain boundaries, but subsidiary cracks at the grain boundaries were common.

Macroscopically 100 pct brittle fractures of martensite tempered for one hour at 400°F display paths of rupture that are predominantly transgranular, with respect to prior austenite grains. Numerous flat transgranular facets give the fracture its brittle appearance, although some evidence of ductility is present even in specimens broken at −320°F.

As recorded in Table I, 51 pct of the fractured surface of the specimen tempered at 400°F and tested at −320°F is brittle by microscopic measurements. As the testing temperature is raised, deformation at the fractured surface increases gradually, until at 212°F only 11 pct of the fracture is brittle. Concomitantly, there is a decrease in the number of plane transgranular facets per unit area of macroscopically brittle area.

Fracture transition is gradual

Microscopic observations confirm the macroscopic appearance. The plane transgranular facets give the fracture a brittle appearance over a considerable range of testing temperature. As the plane transgranular facets disappear, the appearance of the central regions of the fractures of the specimens broken at successively higher temperatures slowly become less brittle without ever exhibiting an abrupt fracture transition.

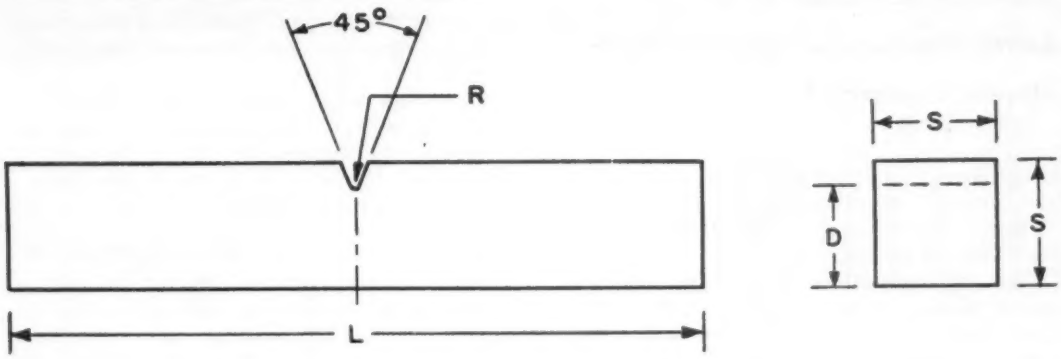
As the fracture transition is gradual, so also is the rise in energy with increase in the testing temperature. The disappearance of the last of the plane transgranular facets from the fracture corresponds in general to the levelling out of the energy curve at the maximum value.

The 100 pct brittle fractures of martensite tempered within the A-brittleness range were predominantly intergranular, with respect to the prior austenite grains. With increase in testing temperature, the intergranular type of fracture persists, giving way but slowly to fractures that show evidence of cold work.

A-brittleness is characterized by intergranular fracture at all testing temperatures where bright facets appear on the fractured surface, and, in this respect, differs from the fractures of specimens tempered at 400°F. On the other hand, the evidence of ductility that come about gradually with increase in testing temperature are microscopically indistinguishable from those observed with specimens tempered at 400°F.

On attainment of the maximum energy in the energy-testing temperature relation, the ruptures of specimens tempered at 400°F and 500°F are alike in microscopic appearance, showing but a superficial cold worked region immediately adjacent to the path of rupture. The path of the ductile rupture is transgranular.

At tempering temperatures above A-brittleness, the 100 pct brittle fractures are characterized by a mixture of intergranular and transgranular brittle partings. In martensite tem-



Type	Linear Scale Factor	L (in.)	S (in.)	D (in.)	R (in.)	Volume ($in.^3$)	S x D Fracture Area ($in.^2$)	Capacity of Impact Machine Ft. lbs.	Hammer Velocity at Impact Ft./sec.
Small	1	1.083	0.197	0.158	0.010	0.042	0.0311	25	11
Standard	2	2.165	0.394	0.315	0.010	0.335	0.124	120 and 240	17
Large	3.3	3.544	0.644	0.515	0.010	1.47	0.332	375	17

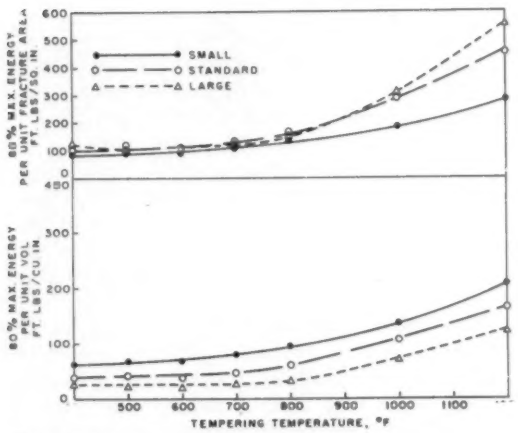

80% MAX. ENERGY PER UNIT FRACTURE AREA FT. LBS/SQ. IN.
80% MAX. ENERGY PER UNIT VOL FT. LBS/CU IN
SMALL
STANDARD
LARGE
TEMPERING TEMPERATURE, °F

FIG. 3—Variation of 80 pct max. energy per unit fracture area and volume for 8640 steel.

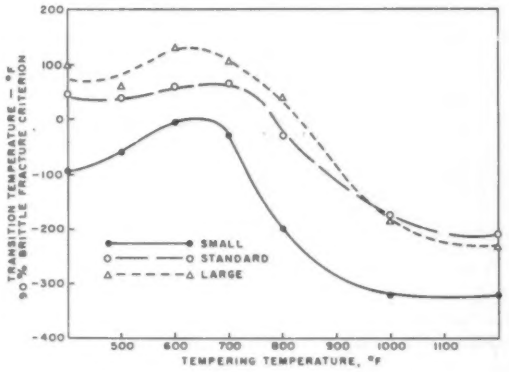


FIG. 4—Variation of transition temperature with tempering temperature and specimen size, 8640.

pered at 1000°F and 1200°F, the brittle fractures continue to be transgranular with respect to the prior austenite grains. There is, however, a marked shortening of the interval of testing temperature required to bring about the transition from 100 pct brittle to a completely ductile fracture.

This is accompanied by macroscopically evident restriction of the region of the fracture in which plane transgranular facets occur. These changes appear gradually as the tempering temperature is raised from 800° to 1200°F.

In the production of steel sections by rolling or forging, the ingot is elongated to form the final section. The orientation of the test specimen with respect to the direction of this elongation affects the ductility values obtained in any given mechanical property test.

The relation of ductility to orientation may be seen in the reduction of area and elongation values obtained with the tensile test, and with the maximum energy values obtained in the V-notch Charpy test.

The latter results are well known to be consistently higher for longitudinal than for transverse specimens, if both types of specimens are taken from the same piece of steel and have received identical heat treatment. The general trend to be expected may be seen in Fig. 1.

In the 4300 steels, the difference between

Microscopic evaluation of brittle fracture corresponds more closely to energy changes . . .

longitudinal and transverse values varies with the hardness and carbon content. The difference in the absorbed energy is greater, the lower the hardness and carbon content.

The differentials by which the maximum energy values obtained with longitudinal specimens exceed the values obtained with transverse specimens are not always those shown in Fig. 1. The difference may depend upon a number of factors. Among these may be the segregation structure of the ingot, fortuitous inclusions in the ingot, and with small reductions, the amount and nature of the reduction process used in fabrication.

One phase of the overall program on the impact properties of quenched and tempered steels

TABLE I

Microscopic Evaluation of Fractures

Specimen*	Tempering Temperature °F	Testing Temperature °F	Energy Ft. Lbs.	Visual % Brittle	Micro % Brittle
QB1-19	400	−320	4½	100	51
QB1-12	400	+212	18	80	11
QB1-13	400	+400	17	...	4
QB2-19	500	−320	1½	100	87
QB2-11	500	+ 85	6	90	49
QB2-4	500	+300	15	...	18
QB3-2	600	−320	1½	100	82
QB3-10	600	+150	8	90	58
QB3-3	600	+600	18	...	13
QB5-14	800	−230	3	100	88
QB5-13	800	+ 50	24	50	32
QB5-10	800	+300	20	0	5
QB6-13	1000	−230	4	100	87
QB6-5	1000	− 50	20	50	27
QB6-2	1000	+200	42	0	11
QB7-11	1200	−320	5	100	74
QB7-13	1200	−120	38½	70	53
QB7-10	1200	+200	62½	0	13

* Laboratory 2340 coarse grain.
Prior heat treatment consisted of austenitizing ½ hour at 2000°F, equalizing 5 minutes at 1550°F, and oil quenching. Tempering time was 1 hour.

was an investigation of the effect of specimen size on energy absorption and transition temperature. The steels investigated were SAE 5140, 4140, and 8600 at four carbon levels from 0.20 to 0.55 pct.

Three sizes of impact specimens, geometrically scaled in every dimension with the exception of the notch radius, were tested. The linear scale factors were 1:2:3.3 with the standard Charpy specimen dimensions having the scale factor of 2, and the other two specimens being subsize and oversize. Specimen dimensions are presented in Fig. 2.

The steels all had sufficient hardenability to harden to at least 99 pct martensite with the one exception of the large specimen of 8620 which was found to have 15 to 20 pct of non-martensitic transformation products.

Study specimen size

Only the results obtained for 8640 will be presented as all the grades investigated exhibited practically identical behavior except for 8620. Fig. 3 presents for 8640 the plot of tempering temperature versus 80 pct of maximum energy per unit volume and per unit fracture area.

It is necessary to consider both area and volume in the analysis. The energy required to cause fracture consists of two parts, one a function of fracture area and the other a function of volume. The latter part consists of the elastic strain energy stored in the entire specimen and stressed parts of the testing machine.

This stored energy is released when it reaches a value high enough to cause self-propagation of the crack without the application of further external energy. Examination of Fig. 3 indicates that in respect to maximum energy per unit fracture area, practically no size effect is exhibited at tempering temperatures between 400°F and 800°F but that a size effect is exhibited at tempering temperatures from 800°F to 1200°F.

In this higher tempering temperature range, maximum energy absorbed increases with specimen size. In respect to maximum energy per unit volume, a size effect is exhibited over the entire range of tempering temperatures from 400°F to 1200°F, absorbed energy increasing with decreasing specimen size.

Now consider the effect of specimen size on the variation of transition temperature with tempering temperature. These data are plotted in Fig. 4 for 8640. Here a definite size effect is observed, the small specimens always exhibiting lower transition temperatures than the other two sizes.

There is not as much difference in transition temperature between the standard and large specimens as between the small and standard. In fact, the size effect between standard and large specimens is exhibited principally at high hardnesses.

However small these differences resulting from specimen size may be, it is significant to note that specimen size does exert some effect and cannot be disregarded.

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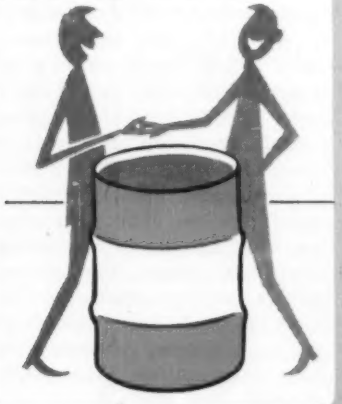

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Swaging equipment

Metal-forming equipment producer has released a new catalog illustrating their line of swaging equipment. It contains technical information about the rotary swaging process, its operation principles and advantages. *Fenn Mfg. Co.*

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Dihedral couplings

A new catalog covers standard, floating shaft and mill motor type dihedral couplings. Working data are given on sizes, capacities and dimensions of couplings designed to handle angular and offset misalignment up to a total of 12°. *Ajax Flexible Coupling Co. Inc.*

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Micro honing

Revised micro honing service and equipment catalog has 32 pages bringing up-to-date company's latest developments pertaining to microhoning applications. Numerous illustrations are included. *Micromatic Hone Corp.*

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A four-page two-color bulletin describes complete line of furnaces for hardening high carbon and high speed tool steels without scale, decarb or carburization. Cross-section diagrams, specifications and performance data on preheat and high speed furnaces are listed. Included is an informative discussion on operation and features of company's hydryzing generator, an inexpensive and fully automatic process for producing atmosphere. *Furnace Division, Lindberg Engineering Co.*

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Industrial trailers

Four new two-page bulletins describe and give full specifications of eight industrial trailers made by one manufacturer. Bulletins cover: fifth wheel steer trailers of 4000 and 6000 lb capacity, fifth wheel steer trailers of four and six ton capacity, heavy and extra duty trailers in ten and 30 ton capacity and dump trucks. Two dump trucks are available in three capacities: ½ cu. yd., ¾ cu. yd. and one cu. yd. *Mercury Mfg. Co.*

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Heavy duty lathe

Ten-page illustrated booklet on company's new 16 in. heavy duty engine lathe and plain bed gap lathe gives details on new headstock which gives speeds to 2000 rpm. It tells how new high-speed spindle mounting gives safe high speeds with long lived precision. Bulletin also gives complete information on spur gear design, combination gear-belt drive, quick change box, apron, four way power rapid traverse, thrust-lock tailstock, compensating V-way bedway design and other features. It also lists specifications. *R. K. LeBlond Machine Tool Co.*

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Steel tubing

Called a buyers' and designers' guide to specially processed steel tubing and cold finished steel bars for hydraulic cylinders and fluid lines, new bulletin provides engineering data on company's cylinder and hydraulic fluid line tubing. Other fluid-power tubing described includes special cold drawn welded cylinder tubing, and seamless tubing specially drawn to O.D. and I.D. tolerances for honed cylinders. Tolerances, mechanical properties, and bursting pressures are given. *Joseph T. Ryerson & Son, Inc.*

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Diesel engines

Diesel engine manufacturer has announced publication of a 14 page bulletin on company's new "family" of diesel engines, available in ratings from 550 to 2400 horsepower. Engines include six-cylinder in-line models and 12 and 16 cylinder "V" type engines. Included are dimension charts, photographs and specification tables. *ALCO Products, Inc.*

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Crawler tractor

Assembly and parts photographs are used in a new 16 page catalog to illustrate design, engineering and operating highlights of company's 75 hp diesel powered crawler tractor. Catalog contains specifications and a two-page spread devoted to the line of equipment matched to the tractor to increase its versatility and job performance capabilities. *Construction Machinery Div., Allis-Chalmers Mfg. Co.*

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Film booklet

Booklet lists films on machines and operations. Twenty-four pages list 123 films. Ranging from 10 to 40 min. show time, they are available without charge. Most films are for sales or training and consequently concerned with specific machining operations. However, some tell interesting and educational stories of machine tools' part in raising living standards. *Nat'l Machine Tool Builder's Assn.*

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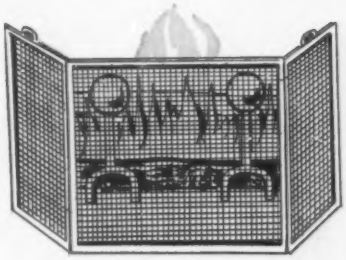

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Tramrail booklet

Replete with a large amount of illustrative material, booklet covers principal components of overhead materials handling systems. Track design and advantages of supporting it flexibly are described in detail. Included are formulas and figures for comparing various track sections. Among subjects featured: carriers for hand, electric and automatic operation; tractors; track switches; standard cranes, transfer cranes and gantry cranes; safety electrification; buckets and grabs. *Cleveland Tramrail Div., The Cleveland Crane & Engineering Co.*

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This section starts on p. 112

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Punching and notching

Many of the more popular hole punching and notching units used in one method of tooling are described in a new illustrated catalog. Specifications and line drawings of the various units are included; also price lists. Plant organization and facilities are outlined. Engineering data sheets graphically show this latest addition to the Unipunch line. *Punch Products Corp.*

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Descriptive catalog sheet gives information on a new kit for use in removing scratches and "sleeks" from car windshields. Kit includes fine quality felt polishing wheel, mandrel, a tube of special polishing compound, marking pencil and a cellulose sponge for quick cleanups. Sheet says it costs well below similar products. *Bristol Sales & Mfg. Co.*

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Rubberized abrasives

Folder, containing 32 case history sheets and several pages of facts and illustrations, covers one company's line of abrasives. These rubberized abrasives can be used for deburring, smoothing and polishing, fact sheets explain. They report uniform controlled polishing action along with top quality chemical rubber bonds. A resiliency factor built into the wheels absorbs shock. Other advantages: broad range of polishing application, uniform textures, safe operating speeds, self dressing, long storage life and more. *Cratex Mfg. Co.*

For free copy circle No. 22 on postcard

Truck battery

Advantages of unique design features in Exide-Ironclad batteries for electric industrial truck service are described and illustrated in a new brochure. How slotted tubular positive plate construction boosts power for peak loads by giving one-third more effective plate area than is found in standard flat-plate batteries is illustrated. *Exide Industrial Div., The Electric Storage Battery Co.*

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Martempering furnaces

Martempering of long steel aircraft weldments with negligible distortion, no quench cracks, and minimum decarburization, by Rohr Aircraft Corp., Chula Vista, California, is described in a new brochure. *Ajax Electric Co.*

For free copy circle No. 24 on postcard

Tool sharpener

Complete grinder description as applied to the sharpening of mining machine tool bits and rock drills, is included in a new bulletin. Particular reference is made in the new text to grinding carbide tipped tools. These are clamped in simple tool holders to hold the tools in correct relation to grinding wheel surface, thus assuring accurate angle and planes desired. Machine uses two 14 in. wheels powered by a large, reversible motor housed in the base. *Ex-Cell-O Corp.*

For free copy circle No. 25 on postcard

Weld head manipulator

Recently made available bulletin on an automatic welding head manipulator includes specifications, general description, special features, and other important data. Features include use of seamless tubing allowing for concealment of power and welding cables towards better manipulator maneuverability and safety; a telescoping type head mount gives operator manual or automatic precision welding head control. *Worthington Corp.*

For free copy circle No. 26 on postcard

Electric fork truck

Folder illustrating and describing a 3000 lb. capacity electric powered fork truck has just been released. Truck features roller mounted inner uprights and elevator carriage, operator's protective cowl, automotive type controls, packaged unit assemblies, low hydraulic pressure, contactor controls, center sill frame and worm drive. Literature contains design specifications and specification drawings. Nearly a dozen photographs illustrate operating views and principal components. *Elwell-Parker Electric Co.*

For Free copy circle No. 27 on postcard

Center, grinder catalog

Revised catalog includes newest cylindrical grinding products, together with data to simplify proper selection of these machine tools. A front cover indexing arrangement makes it easy to locate information for any type center or grinder dog. *Ready Tool Co.*

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If you want more details on products advertised in this issue fill in below:

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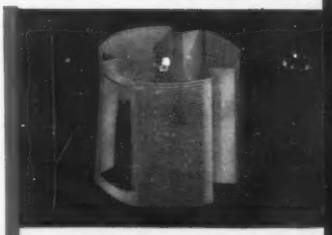
the *CLEARING ROBOT* that's setting records at HOTPOINT

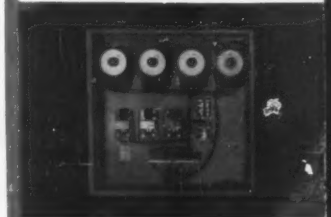
Here's a Clearing high speed press that's making steel confetti fly at Hotpoint's Home Laundry plant in Chicago. Each piecepart has 5,000 perforations which are grouped in three different locations. The press operates at a speed range of 125 to 250 strokes per minute and "thinks" for itself in the matter of locating the hole groupings and the number of holes which is correct for each grouping.

The result is a finished part from which the cylinder of a dryer basket is made. It's a result that gives Hotpoint accurate parts, produced economically with a minimum of material handling.

If there is a place for one of "Speedy's" energetic and thoughtful brothers in your manufacturing plans, call on a Clearing sales engineer to talk the problem over.



Hotpoint dryer basket after it has been perforated and rolled into its cylindrical shape.



Part of the electronic brain that tells "Speedy" when to start and stop and where to locate the perforations.

CLEARING PRESSES THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION • *Division of U.S. INDUSTRIES, INC.*

6499 W. 65th Street, Chicago 38, Illinois • Hamilton Plant, Hamilton, Ohio

INSPECTION: X-Ray Motion Pictures

Engineers tackle "near impossible" motion picture problem . . . Films are taken of internal combustion engine's innards while it is running . . . Engine design alterations, even basic changes are forseen.

Taking motion pictures of the inside of an internal combustion engine is generally considered difficult. Not content with solving this problem, a group of engineers have tried to do the near impossible feat of shooting films of an engine's interior — while it is running. Moreover, they have succeeded.

The job involves taking X-ray pictures of the internal movements through the engine's steel housing, and visually "stopping" with a camera their high-speed motion.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 117. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Performance, Wear Viewed

Called stroboradiography, the new technique is expected to have significant effects on engineering design. Slow-motion movies and still pictures of pistons, cams and other moving parts have enabled General Electric-Detroit Arsenal engineers to scrutinize complete engine operation cycles for faulty performance or wear.

The process gives designers their first glimpse inside a completed machine operating at normal speed under load conditions. Improved, light-weight designs, and even important basic design changes are possibilities foreseen by GE from the X-ray motion studies.

Betatron Used

Special equipment, developed by GE, is used with a high-energy industrial X-ray betatron, operating at 5 million to 15 million volts. Their General Engineering lab, Schenectady, N. Y., developed the equipment in co-operation with Detroit Arsenal and GE's X-ray Dept. in Milwaukee.

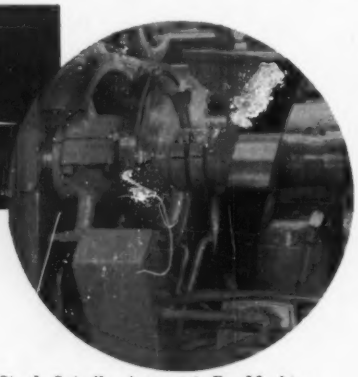
Unlike conventional equipment, the betatron furnishes surging radiation pulses (416 per second). Previously, single-shot exposures of moving objects had been made with low-energy equipment. Radiograph's quality suffered, though, when the object was composed of heavy parts of varying thickness.

Engine Improvement Seen

Thousands of short exposures accurately synchronized with the moving part are taken. With an exposure time of 10 to 15 millionths of a second, it is possible to radiograph an engine turning at several thousand revolutions a minute.

Raymond A. Pulk, Detroit Arsenal's Materials Laboratory chief, who conceived the betatron's use, says the technique "will furnish the engineer with a valuable tool to be employed in design and efficiency studies based upon output performance and will definitely contribute to improvement of engine designs."

SPLIT SECOND
COOLANT FLOW
with Ruthman GUSHER Coolant Pumps



Illustrated is a Cleveland Dialamatic Single Spindle Automatic Bar Machine equipped with a Gusher Coolant Pump.

Model 5-P 3

Your Gusher Coolant Pump is always primed and ready to deliver coolant instantaneously. There is no lag — no waiting for the flow to start — and you can easily regulate the volume from a trickle to full capacity.

Pre-lubricated ball-bearings, electronically balanced rotating shaft, and totally enclosed dustproof motor assure you also of long trouble-free life for your Gusher Coolant Pumps.

THE RUTHMAN MACHINERY CO.

1809-1823 READING ROAD CINCINNATI 2, OHIO

Standards:

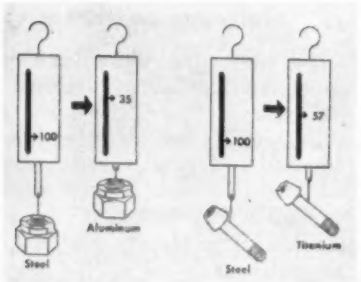
What makes a miniature bolt a miniature?

"Miniature," according to Webster's dictionary, means: "A representation on a much reduced scale." Hence, the much publicised trend toward miniaturization is traditionally thought of as the process of making things smaller.

Not so, state a group of miniaturization philosophers at the Standard Pressed Steel Co., Jenkintown, Pa. "Miniaturization is big," they contend.

Not Limited

Back of their reasoning is this: "First," contend the creative thinkers at SPS, "because it isn't limited to tiny things at all but can be applied profitably to big things."



Same-size, less-weight bolts are new miniaturization examples.

Re-defined in a new booklet published by the company, the word is said to mean "the art and science of providing more service, more function, more utility per unit weight or volume of product."

Size Reduction Unnecessary

The firm reenforces its definition with examples showing that profitable miniaturization can be accomplished without reducing size. In fact, it even reasons how it can be done by increasing size.

"Miniaturization in machine tools through the use of new models that out-produce their predecessors, miniaturization of weight through use of lightweight wonder metals in same-size products and

When you buy *Acme-Gridley* you get **SERVICE** *ANYTIME, ANYWHERE*

Dozens of Acme-Gridleys—the "heart" of mass production lines—idle in the smouldering rubble. When these machines had cooled down, they were sent to our plant where immediately upon arrival they were disassembled, new parts ordered from stock and machines then routed through our assembly line for reassembly and testing.

Within six weeks all but a few of these automatics were on their way back to the customer —ready once again to do their job.

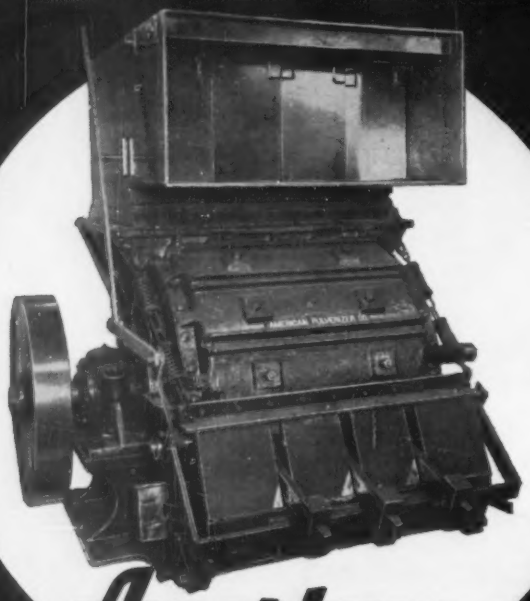
National Acme

The NAMCO nameplate on your machine assures service — in emergency or normal situations — when and where you need it.

THE NATIONAL ACME COMPANY • 175 East 131st Street, Cleveland 8, Ohio

CASH IN YOUR CHIPS

Change Metal Turnings Waste into More Profitable Shoveling CHIPS



American METAL TURNINGS CRUSHERS

No progressive, profit-conscious company—who produces 10 or more tons of metal turnings per month—can afford to ignore the profit potential of a modern chip salvage system . . . with an American Metal Turnings Crusher at the core.

American installation profits include: $4 more per ton for chips than for machine turnings; up to 50 gallons per ton in cutting oil recovery; 75% less storage; easier, faster handling.

How many profit dollars are you losing under present operations? If, for example, you're currently producing 20 tons of turnings a month . . .

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

240 Tons Metal Turnings per Year (20 tons/month at $4 extra per ton)	$ 960.00
6,000 Gallons Recovered Cutting Oil at 30¢/Gal. (50 gals. per ton x 240 tons = 12,000 gals. Half of this, 6,000 gals., can be credited to use of chips instead of turnings in reclamation)	$1,800.00
Estimated Savings in Manpower, Storage, Tools, Maintenance, Freight, etc.	$ 300.00
TOTAL GROSS PROFIT	$3,060.00

American PULVERIZER COMPANY

Designers and Manufacturers of Ring Crushers and Pulverizers

WRITE for Metal Turnings Crusher Bulletin.

1439 MACLIND AVE. • ST. LOUIS 10, MO.

miniaturization even in giant power plant turbogenerators which are now replacing many smaller units that collectively cost much more and take up much more space," are given as examples of the new meaning.

The Fastener Industry

Probably the best example of the company's theory is in the fastener industry, a field for which the company is well known. Here, they clarify their "miniaturization of weight" theory. Says the booklet: "Size-for-size substitution of lightweight metals for steel—aluminum locknuts or titanium aircraft bolts, for example—results in dramatic weight reductions without loss in performance."

Corrosion:

Nickel shortage increases corrosion control search

The tightening nickel market has been of particular concern to the process industries where nickel and high nickel alloy pipe lines and vessels play a vital part in corrosion and product contamination control. The situation has given great impetus to the continual search by the process industries for a material of construction with the advantages

Seamless steel pipe, fittings get pure nickel on ID.

of pure nickel which would be readily available even in the face of government stockpiling of huge quantities of nickel.

One company which has been benefiting by the shortage-created

market is the Bart Manufacturing Corp., Belleville, N. J. Developers of the Lectro-Clad process, which deposits pure nickel in tailored thicknesses on the ID of seamless steel pipe and fittings, and on one or both sides of steel sheet and plate. The Bart organization has been forced to almost double their production facilities in order to meet the greatly increased demand for their product. Utilizing only a fraction of the nickel required by nickel alloy materials, products reportedly are characterized by high strength, heat tolerance, non-porous corrosion and contamination resistant surface, and ease of field fabrication and repair.

Pipe Supplied to AEC

Five hundred miles of Bart pipe was supplied to the government a dozen years ago, for use in atomic energy development work. Since that time, most of Bart's production has been channeled to the AEC and other government agencies.

Methods:

Electronic digital computer solves design problem

Potentiometer design problems are solved in minutes instead of hours or days with an electronic digital computer. It reduces computation time of non-linear potentiometers from 32 man-hours to only 15 minutes.

The precision potentiometer, produced by the Helipot Corp., Pasadena, Calif., is basically a voltage-dividing electro-mechanical transducer, used to provide voltage output which is a function of some mechanical motion.

Engineers Calculate Location

In designating a non-linear potentiometer, Helipot engineers must calculate the location of tap connections to the resistance element, the values of padding resistors between taps, and the position of each turn of resistance wire on the mandrel. This requires the calculation of a mathematical function that will cause

Because they are produced by *turning*, rather than by less accurate methods, Fischer brass and aluminum nuts set new standards of precision and quality that speed assembly operations . . . reduce costs. Uniformly accurate, Fischer nuts are tapped square with the face to Class 2 tolerances . . . countersunk on both sides . . . burrless . . . cleaned and degreased before delivery.

You pay no premium for Fischer *precision-turned* nuts . . . they're priced no higher than those made by less exact methods.

Prompt delivery of all standard types and sizes is assured by large factory stocks . . . "specials" can be produced quickly and economically.

HERE . . . take a look at precision

C-281-FS

Investigate the savings possible with Fischer turned nuts. Write today for Catalog No. 55.

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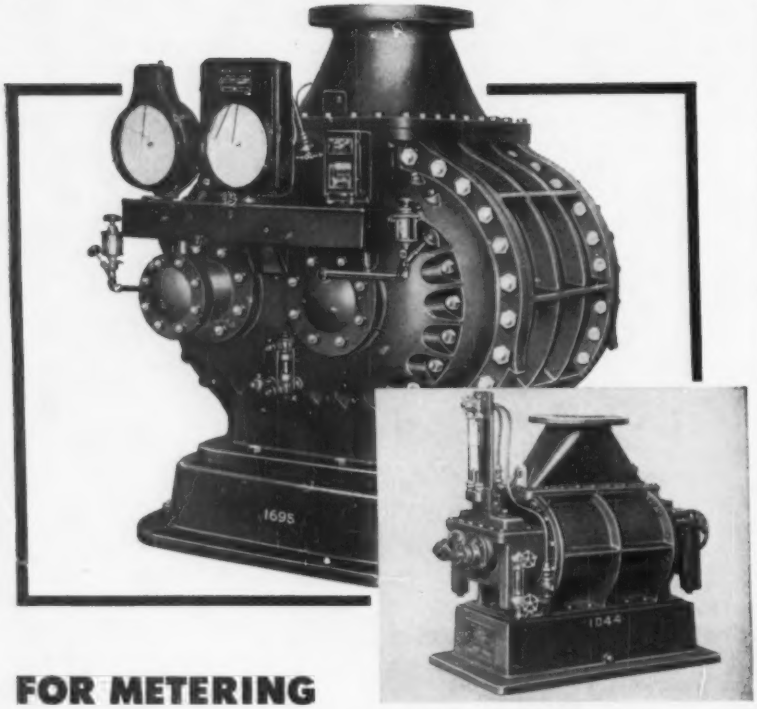
SPECIAL MFG. CO.
445 Morgan Street
Cincinnati 6, Ohio

TURNED NUTS Fischer SPECIAL MFG. CO. CINCINNATI OHIO SINCE 1905



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R-C *plur-ability*

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Look for R-C plur-ability in all your equipment to handle gas and air

Centrifugal and Rotary Positive Blowers, Gas Pumps and Exhausters

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Ask for detailed bulletins on any R-C product—or write us your needs.

Packed into every Roots-Connersville Positive Displacement Gas Meter are important values which mean *"plur-ability."* Summed up, they give you accuracy unmatched by any other type—that endures over many years of use. Maintenance is practically unknown, with no vanes, valves, or small parts. Compactness saves space and foundation cost. Capacities, pressures and overload ability fit your most exacting needs. Wherever you need to measure gas from 5,000 cfh to a million, you can trust the staying qualities of R-C Positive Displacement Meters. Ask for specification details in Bulletin M-152.

ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.

1255 Ohio Ave., Connersville, Indiana. In Canada—629 Adelaide St., W., Toronto, Ont.

Helipot's special coil-winding equipment to lay each turn of resistance wire at the required position.

Located at the Logistics Computer Service Center, Redondo Beach, Calif., the computer leased on an hourly basis, actually made the same decisions that a potentiometer designer might make if he could use an extremely accurate French curve on a huge piece of graph paper. Helipot engineers

Digital computer solves hours-long problem in minutes.

established criteria for bad points and coded the computer so that it evaluated the customer's data against the criteria, discarding the bad and accepting the good points.

First organized six months ago, the Logistics Computer Service Center offers use of the computer, designated ALWAC, to organizations requiring the use of a part-time computer, and to present computer users with extra-heavy work loads.

Controls:

Magnetic switch eyes assembly operations

Assembly-line automation appeared to have moved a step closer to actuality recently with the development of a new switch, operating on the "proximity" principle, to keep tabs on moving metal parts.

Electronic research engineers at Minneapolis - Honeywell's Doelcam Div., Boston, who designed it say

the new switch works like a "magnetic detective" to locate objects containing iron on assembly lines, in liquids and even the moving parts of automatic machine tools. The switch has no moving parts. There is no physical contact with the work piece required; detection is accomplished by the object's passing through a magnetic field set up directly in front of the switch's sensing end. A signal flows through the magnetic circuitry of the switch and operates a remotely located electrical control relay. This relay can be triggered up to 10 times per second.

First Major Improvement

George J. Schwartz, vice president and general manager of the division, said he believed the proximity switch represented the first major improvement in switch technology since the advent of snap action switches.

He said the first application of the new switches will be on 1958

Magnetic detective locates iron objects on assembly lines.

engine block manufacturing lines for the Ford Motor Co. Ford has purchased 2000 of the switches for its plants in Cleveland, Lima and Dearborn.

In assembly-line operations, Schwartz explained, the switches program the operations as the metal part moves from one station to another. Any break in the sequence is immediately detected and generally shuts down the line until the cause can be corrected.

Practical Idea for the Production Man

Efficient electric hoists...to move materials overhead and release floor space for more valuable operations.

CM HOISTS

CM LODESTAR ELECTRIC CHAIN HOIST
⅛ to 1 ton capacites—First truly heavy duty version of small electric hoist. ⅛ ton model weighs only 51 lbs. Heavy duty self-adjusting brake. Upper-lower safety limit switches. CM-Alloy load chain.

CM METEOR ELECTRIC WIRE ROPE HOIST
½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control.

Good Suggestion for the Maintenance Man!

Rugged lightweight hand hoists and pullers...to make your job easier and safer

CM CYCLONE HAND HOIST
⅛ to 10 ton capacities—Easy to carry and lift. One ton model weighs only 36 pounds. Made of tough aluminum alloy. CM-Alloy load chain. High efficiency. Lifetime lubrication.

CM PULLER THE "ONE MAN GANG"
⅛ to 6 ton capacities—Lifts or pulls at any angle. Lever handle operation. Automatic load brake holds at any point. ⅜ ton model weighs only 13 pounds. CM-Alloy flexible load chain.

ALSO... *CM Trolleys and Cranes*

Call the CM distributor for descriptive literature, prices and fast delivery from stock.

CM HOISTS AND CHAIN

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COLUMBUS McKINNON CHAIN CORPORATION
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THE DIES ARE YOURS FREE!

Yes, we do hundreds of stamping jobs without making special tools—and there's a good reason for this. In stamping out laminated shims for over forty years, we've developed much special equipment and tooling unknown in the average stampings house... including an arsenal of blanking dies and punches...and we've acquired unusual production techniques and skills. This equipment and these special skills are at your service without charge.

ROCK-BOTTOM PRICES . . . BY THREE METHODS!

These three separate production techniques are judiciously applied to save you money on your stamping needs!

MACHINE CUT METHOD. Regardless of quantity, we have the method that fits your needs best! For half-a-dozen or a few hundred stampings, our *Machine Cut Method* produces the stampings at amazingly low cost.

SHORT RUN METHOD. As quantities increase, we shift to the ***Short Run Method,*** with stock tooling and temporary dies—such as the surprisingly low-priced Hecht-type die.

PRODUCTION METHOD. Or we shift to our ***Production Method*** using high speed self-feeding presses.

For full information, send for our free 12-page booklet "Service In Stampings." And next time you need stampings, why not let us bid—and discover the savings we offer you!

LAMINATED SHIM COMPANY, INC.

STAMPINGS DIVISION

"ONE PIECE OR ONE MILLION"

3208 UNION STREET • GLENBROOK, CONNECTICUT

Waste:

Chemical coagulants speed up mill scale separation

Separation of flue dust and mill scale particles from wastes flows is effected by sedimentation. Now this process can be speeded up by new chemical coagulants. Plain gravity separation without the use of chemical aids can insure as clear an effluent, but requires much longer periods of quiescent settling, necessitating low tank overflow rates, which mean large tank areas.

The main advantage of using chemicals is the large saving in the dimension of the tanks and of the area they occupy. The main disadvantages of using chemicals are their cost, the closer control of the operation and the introduction of chemical handling equipment.

Fixed Boundary Growth

Many steel plants have had to grow over the years within fixed boundaries. Increased steel producing capacity has been obtained by crowding bigger equipment in restricted areas. As a result, there is a high premium on space. In certain plants the annual value of finished steel produced is $2,000,000 per acre. Under such conditions, any method that limits the "site" demands of wastes treatment and recovery facilities should be investigated.

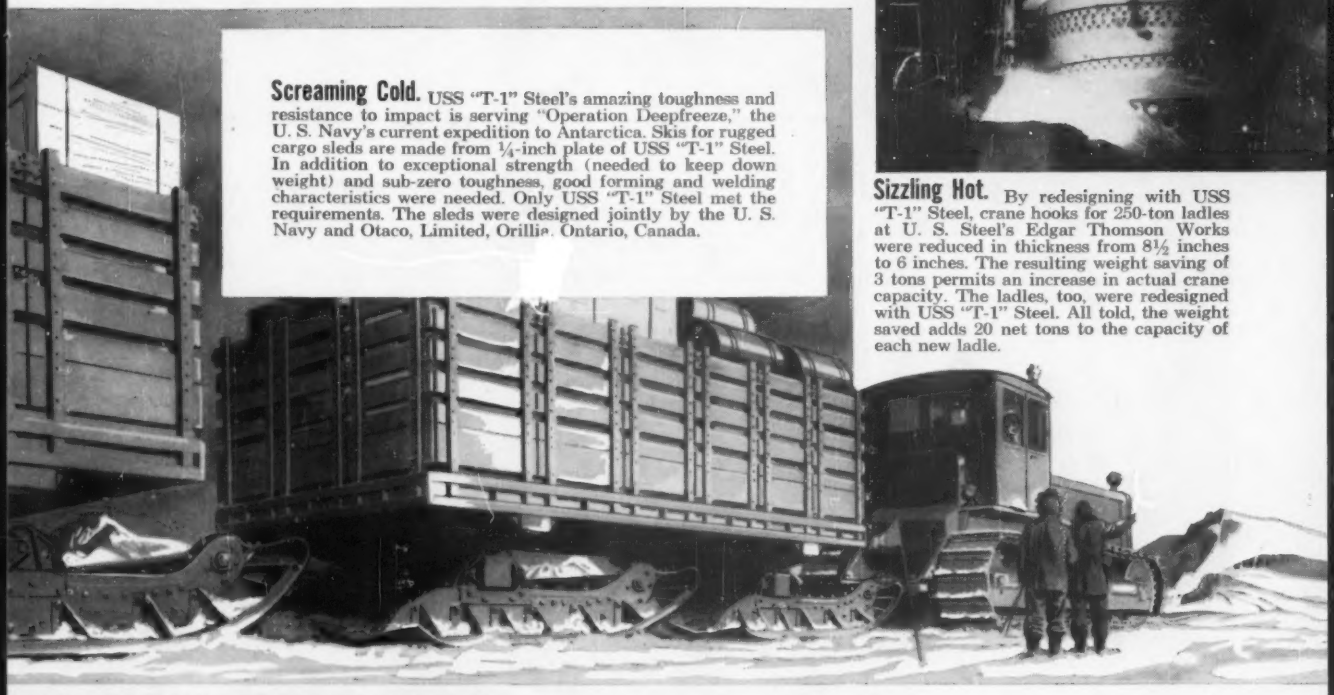
In this regard, the chemicals recently made available for wastes treatment are important because: (1) In existing treatment plants, overloading can be overcome and the efficiency of interception of the suspended material restored to the point of producing an acceptable effluent, and (2) In proposed treatment plants, effective interception can be achieved by much smaller units.

New Coagulants

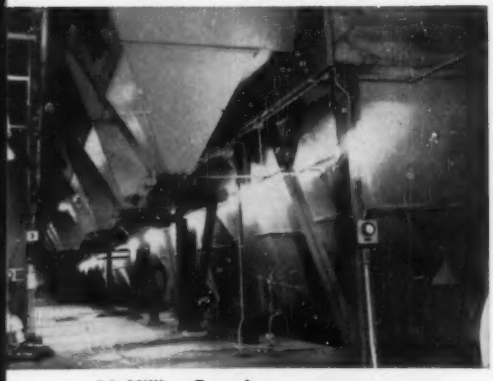
The new coagulants are the organic polymer type manufactured by Dow Chemical Corp., American Cyanamide Corp., National Aluminate Co. and others.

HOW USS "T-1" STEEL IMPROVES THESE PRODUCTS:

Sizzling Hot. By redesigning with USS "T-1" Steel, crane hooks for 250-ton ladles at U. S. Steel's Edgar Thomson Works were reduced in thickness from 8½ inches to 6 inches. The resulting weight saving of 3 tons permits an increase in actual crane capacity. The ladles, too, were redesigned with USS "T-1" Steel. All told, the weight saved adds 20 net tons to the capacity of each new ladle.



Screaming Cold. USS "T-1" Steel's amazing toughness and resistance to impact is serving "Operation Deepfreeze," the U. S. Navy's current expedition to Antarctica. Skis for rugged cargo sleds are made from ¼-inch plate of USS "T-1" Steel. In addition to exceptional strength (needed to keep down weight) and sub-zero toughness, good forming and welding characteristics were needed. Only USS "T-1" Steel met the requirements. The sleds were designed jointly by the U. S. Navy and Otaco, Limited, Orillia, Ontario, Canada.



28 Million Pounds of wet, abrasive coal are handled each day at this steam-electric generating station. And USS "T-1" Steel is being used at points of severe wear in coal chutes and hoppers, pulverizer feed pipes and exhaust pipes, and for liners of ash collectors. USS "T-1" Steel's durability under impact and impact abrasion, its great tensile strength and its good weldability are often essential in rugged coal handling equipment. USS "T-1" Steel can add service life and cut repair and maintenance costs in many types of heavy-duty equipment.

Repair Reduces Downtime. In this coal stripping operation, time costs more than any other item; and *lost* time, caused by breakage and wear of power shovel parts, was costing far too much. So the owner, Putnam & Greene, Inc., Philipsburg, Pennsylvania, started using USS "T-1" Steel for repair work. As a result, size and weight of parts have been reduced, while durability has been improved substantially. What's more, USS "T-1" Steel's good weldability speeds repair work.

How It Can Help You

USS "T-1" Steel, with its high minimum yield strength of 90,000 psi and its minimum tensile strength of 105,000 psi, can help you design or build lighter-weight equipment that will last longer. Its unusual toughness can help you design or build equipment capable of taking heavy impact and abuse at sub-zero temperatures. Its excellent weldability can help you cut the cost of fabricating highly stressed parts, and to reduce repair and maintenance expense. Its good creep rupture strength can help you put more durability in equipment that operates at temperatures as high as 900 degrees F.

Somewhere in your operation, versatile USS "T-1" Steel can help you. Write, wire, or phone United States Steel, Room 5435, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS

UNITED STATES STEEL

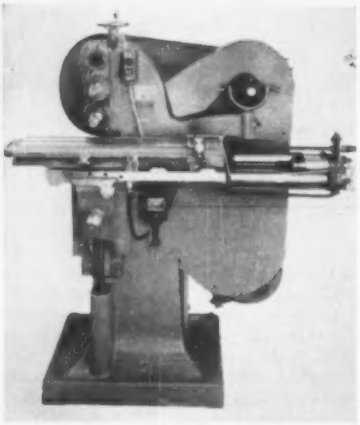
NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 117 or 118.

Remote-controlled head marks billets and slabs

Operated by remote control, a marking head has been developed to accompany one manufacturer's pneumatic billet markers. One or more characters on the marking head can be changed from the operator's pulpit. Cut letters and ingot numbers can be controlled remotely as well as heat numbers. This new safety marking head can be made with a series of number or letter wheels, each wheel individually controlled so the complete marking operation can be controlled from the pulpit. A modification of the controlled head includes a holder with interchangable type. With this model, type is changed manually for heat number, while cut letter and ingot numbers are controlled remotely. Marking heads can be designed to fit almost any requirement down to three in. thick slabs and 4 x 4 in. billets. All larger sizes can be handled. Marking units can be made with practically any size character, dependent on minimum size slab or billet to be marked. Earlier improvements developed for the marker include: electrical or air operated mechanical positioning devices. *M. E. Cunningham Co.*

For more data circle No. 29 on postcard, p. 117



Improvements double hand milling machine production

Production capacity of one company's hand milling machines is reportedly doubled with air-hydraulic feed combining with a new two spindle head. It has 12 in. storke "skip" table feed. Two vises or other work holding fixtures may be mounted on the table. Thus, two or more work pieces can be milled during each complete pass. The two spindle head can also be adapted to firm's hand or power table feed millers. The upper spindle may be raised or lowered to handle various work sizes and types and to compensate for cutter wear. The lower spindle is driven by V-belt from the backshaft pulley; the upper spindle through a gear train from the lower one. Spindles rotate in opposite directions to permit milling from both directions. Feed device and spindle arrangement are credited with increasing flexibility. According to the manufacturer they may be adapted for many types of products for faster milling. *U. S. Burke Machine Tool Div., Cincinnati Mfg. Corp.*

For more data circle No. 30 on postcard, p. 117

Wire flattening mill produces wire at 2500 fpm

Capable of obtaining high speeds, this recently unveiled wire flattening mill is said to produce wire at 2500 fpm. The mill is equipped with six in. diam by four in. face width tungsten carbide sleeve rolls. These run on heavy duty needle type roller bearings and ball type thrust bearings. A die holder and vertical edging unit are mounted on the entry side of the mill. A traversing recoiler is synchronized with an infinitely variable 7½ hp eddy current clutch motor. The drive includes an electronic control unit. It also contains an operator's control station with start, jog and stop push button controls. A speed setting potentiometer is included. *Stanat Mfg. Co., Inc.*

For more data circle No. 31 on postcard, p. 117

Use WELDED STEEL for Greater Strength with Less Weight!

The 50-ton weldment above is one of fifty-five identical Press Beds produced for one manufacturer of heavy presses. This piece, and the parts and assemblies illustrated at the left, are typical of thousands of Steel-Weld Fabricated units produced and machined by Mahon for manufacturers of processing machinery, machine tools, and other types of heavy mechanical equipment. Are you taking full advantage of the possibilities offered by welded steel components in your products? In the design of almost any type of heavy machinery there are pieces and sub-assemblies that can be produced more satisfactorily and more economically in welded steel —and with the additional advantages of less weight, greater rigidity and predictability. When you consider weldments, think of Mahon . . . because, you will find the Mahon organization a unique source for welded steel in any form . . . a source with complete facilities for design engineering, fabricating, machining and assembling . . . a source where design skill and advanced fabricating techniques are supplemented by craftsmanship which assures you a finer appearing product embodying every advantage of Steel-Weld Fabrication. See Sweet's Product Design File for information, or, better still, have a Mahon sales engineer call at your convenience.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York and Chicago

Engineers and Fabricators of Steel in Any Form for Any Purpose

MAHON

Sander-grinder utilizes abrasives under ¾ in. diam

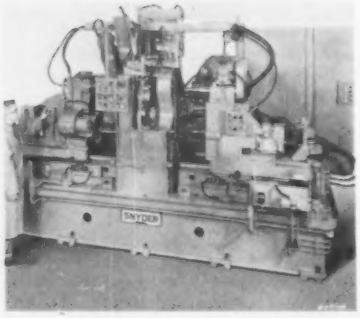
Reportedly the first to utilize abrasives on work spindles under a diameter of ¾ in. is this oscillating spindle sander-grinding machine. The unit is provided with spindles ¼, ⅜, ½ and ¾ in. in diam. With the smaller diameters any kind of scroll-grill work or small radius contours can be machine finished many times faster and better than by hand or by any other type of sander, according to the manufacturer. A second new feature speeds changing the arbors or drums carrying the abrasive sleeves, reports the maker. All arbors have taper-shanks which install instantly into a new taper-socket type main spindle. Still another advantage claimed by the company is that the drums for abrasives over ¾ in. diam may remain permanently on the new type spindles. The complete arbor, drum and abrasive assembly installs or interchanges with another size in a few seconds, according to the sander-grinding machine manufacturer. *Boice-Crane Co.*

For more data circle No. 32 on postcard, p. 117

New honing machine is electronically controlled

Said to offer for the first time instantaneous use of cutting speeds in honing precision parts, this machine has limit switches to control both honing and complete honing stone usage. The same stone can be used to "hog out" stock while obtaining a micro finish. It provides feed and speed control from 100 to 1600 rpm using variable speed motors. Unit has automatic workpiece loading. Dimensional accuracy of a tool room nature is promised on production runs. Automatic cutting speeds start with low rpm for roughing. When part is within a predetermined ten-thousandth of finish size, a very high rpm automatically takes over to produce a low micro finish. Self-acting sizing not only ends honing cycle when size is reached but also permits operator to visually explore bore during honing. This is done with a pneumatic honing and measuring device that is said to have all the advantages of air gaging. Stone pressure control also assures right cutting pressure. Automatic stone use-up control enables 100% of usable stone life, company says. *National Pioneer, Inc.*

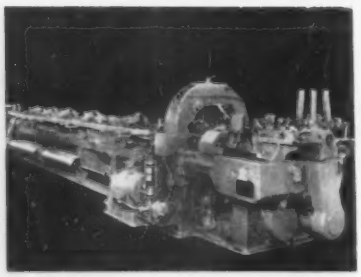
For more data circle No. 33 on postcard, p. 117



Trunnion type boring setup machines and assemblies

This six station trunnion type, two-way precision boring machine is said to perform both machining and automatic assembly operations. It has six ft boring spindles. Rotary hopper feed directs split babbitt bushings to a plunger for press-fit assembly in the part at the fourth station. Deflections of the part during assembly operation is prevented by a hydraulic stop that advances to within 0.002 in. of the back face of the part. This unit machines 5 11/16 in. diam die cast electric motor end shields and assembles a bushing in the center hole at a production rate of 350 pieces an hour at 75 pct efficiency. It occupies a floor space about 8 x 14 ft and is eight ft high overall. *Snyder Tool & Engineering Co.*

For more data circle No. 34 on postcard, p. 117



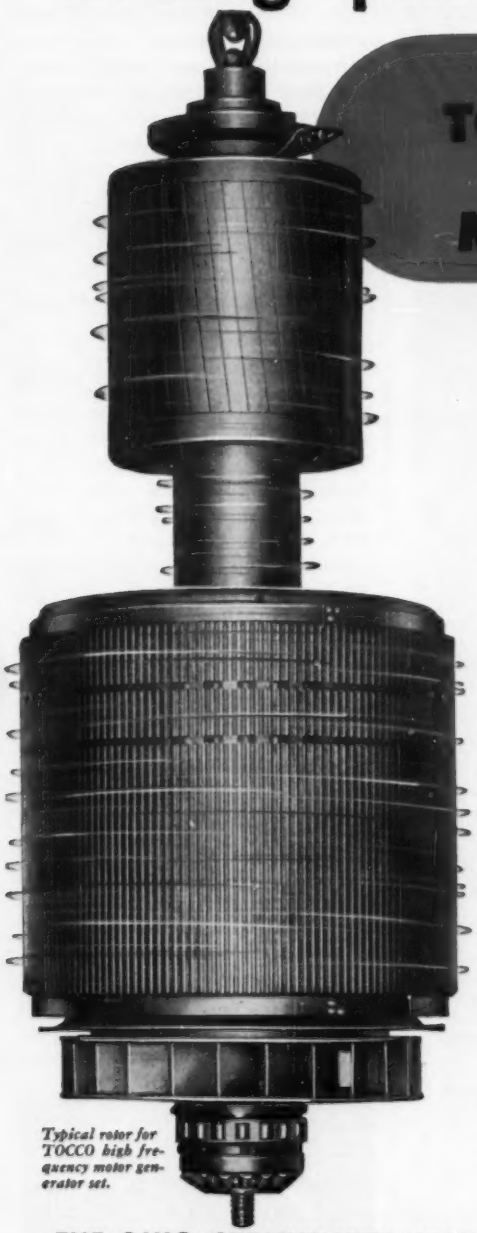
Bodymaker, soldering unit makes 500 cans per minute

Announcement has been made of a high-speed body making machine for cans of 2 1/16 to 4¼ in. diam and 2¾ to 5¾ in. high. The bodymaker and soldering machine has speeds of 400 to 500 per minute. Features include: all crank actuated motions from a central crankshaft, a positive cam actuated body clamp, "V" belt drive through helical gears and provision for stopping with feed bars on the back stroke by means of a high torque brake. Automatic stops are provided throughout as a safety feature if a jam should occur. *Baldwin-Lima-Hamilton Corp.*

For more data circle No. 35 on postcard, p. 117

"Nothing Spins Like a Top"... *except*

TOCCO'S VERTICAL Hi-Frequency Motor-Generator Sets



Typical rotor for TOCCO high frequency motor generator set.

First with Vertical MG Sets—TOCCO

In 1943 TOCCO designed and built the first vertical motor-generator sets for furnishing hi-frequency power for induction heating applications. Now with thirteen years of continuous production experience, we are far and away the world's largest supplier of these units.

Advantages of TOCCO Vertical MG Sets

The large TOCCO vertical type motor generator set has numerous advantages over conventional horizontal type sets. Vertical construction permits the use of very large bearings and also minimizes the hazard of major damage to the set in the unlikely event of a bearing failure. Longer bearing life is achieved due to lower pressure and uniform loading of the bearings. Maintenance is greatly simplified because the rotor can be removed vertically with a simple hoist. Anti-vibration mountings between the base and the MG rotor-stator assembly practically eliminate vibration. No special foundations are needed. Lastly, TOCCO's vertical design cuts necessary floor space to less than one-half the area required by horizontal motor-generator sets.

TOCCO Vertical MG sets are available in sizes up to 350 KW and frequencies from 1000 to 10,000 c.p.s.

Only Time-Tested Vertical MG Sets—TOCCO

There are over a thousand TOCCO vertical MG sets in actual service TODAY—more than all competitive horizontal makes combined. Write us for descriptive bulletin giving full details on the advantages and construction details of TOCCO Vertical MG Sets.

THE OHIO CRANKSHAFT COMPANY

TOCCO

NEW FREE BULLETIN

Mail Coupon Today

THE OHIO CRANKSHAFT CO.
Dept. A-8, Cleveland 5, Ohio

Please send copy of "TOCCO High Frequency Motor-Generator Sets."

Name_____

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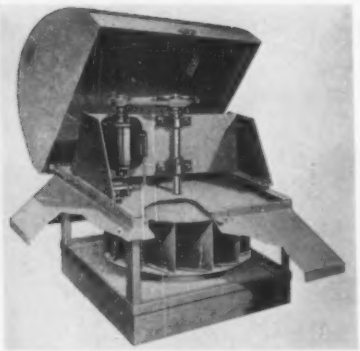
Address_____

City_____ Zone____ State_____



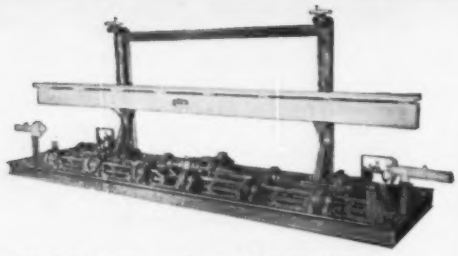
Ventilator pair offer quiet, efficient operation

Designed for efficient, quiet operation at slow speeds, a pair of new centrifugal ventilators are recommended for commercial and industrial applications where low noise levels are desirable. Both are available in "V" belt drive for large capacities from 675 to 36,430 cfm. A low profile spun aluminum model is obtainable for capacities from 408 to 2,508 cfm. All models have PFMA certified capacity label guaranteeing ratings. Both have air - cooled motor compartments insulated by resilient rubber vibration pads. "V" belt model comes in 13 basic styles. Three damper types and motors from 1/6 through 7½ hp offer wide adaptability. Direct drive units come in two styles, four damper types and motors from 1/12 to ½ hp. *Burt Mfg. Co.*

For more data circle No. 36 on postcard, p. 117

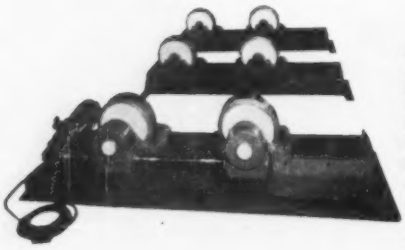
WEBB TANK PRODUCTION MACHINERY

REED TRACK SUPPORTS For Automatic Welding Head Carriages



Increase production — use this fixture on 4' to 12' diameter work. Welding track is 24' to 34' long. Powered vertical adjustment is available for all models. May be used with your present turning rolls, welding positioners, special jigs for straight seam work, or portable type rolls illustrated below.

REED Portable Type TURNING ROLLS



For manual or automatic welding and other operations requiring rotation of a cylindrical vessel. Capacities range from 3 tons to 75 tons; larger units built to special order. Powered by electric motor with variable speed transmission. Readily portable, they may be used free or anchored to the floor as desired.

Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

FOR ILLUSTRATED LITERATURE WRITE DEPT. E

REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.

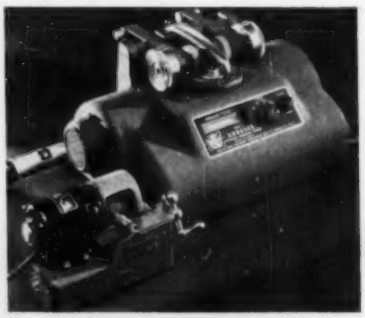
Cools tool, not chips

Discovery that the refrigeration principle could be utilized in metalworking is now making many machining operations easier and faster. It is reported that cooling with mist has changed the entire concept of cooling and lubricating all types of fabricating operations. Chips, heated by the separation from the work, transfer heat to the tool which then loses its temper and sharpness and provides a poor finish. Flood cooling lacks efficiency because coolant is applied to the chips and not tool's cutting edge. Refrigerated mist cools actual cutting edge. *Aetna Mfg. Co.*

For more data circle No. 37 on postcard, p. 117

Abrasion tester

Resistance of surfaces to abrasion is evaluated with this precision instrument. Dual abrading wheels traverse a complete 360° circle on the tested surface. A variety of



holders are supplied for testing sheer silks, textiles, metals, leather, rubber and linoleum. *Taber Instrument Corp.*

For more data circle No. 38 on postcard, p. 117

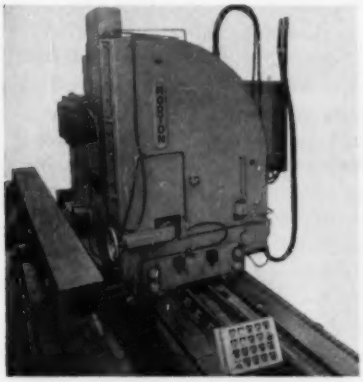
Rail tractor is powered by battery

Interesting addition to firm's line of custom-built, self-propelled industrial handling units is this powerful rail tractor, driven by storage battery. Tractor is built to pull two trail cars with a gross trailer load of five ton. Trail cars can also be supplied by the company. Trail cars for the unit illustrated were built for ball-handling service at a mining operation. The same or similar equipment is adaptable to many other industrial services. Power is sufficient to assure starting with a full load from a standstill on a curve. The tractor and its trailers operate on 24 in. gauge track at speeds up to 300 fpm, negotiating sharp radius curves at 50 fpm. *Easton Car & Const. Co.*

For more data circle No. 39 on postcard, p. 117

Heavy duty grinder

For the grinding of long members, this machine has a special feature of grinding either straight surfaces or long curve irregular surfaces to template. It is basically a traveling wheel type with work remaining stationary. A rugged compound saddle is mounted on the bed and is moved longitudinally by means of a heavy duty roller type chain driven through sprocket and worm reduction by a variable voltage or reversing motor. This gives a smooth power flow in varying speeds up to 100 fpm. Any length of bed can be used. *Morton Mfg. Co.*



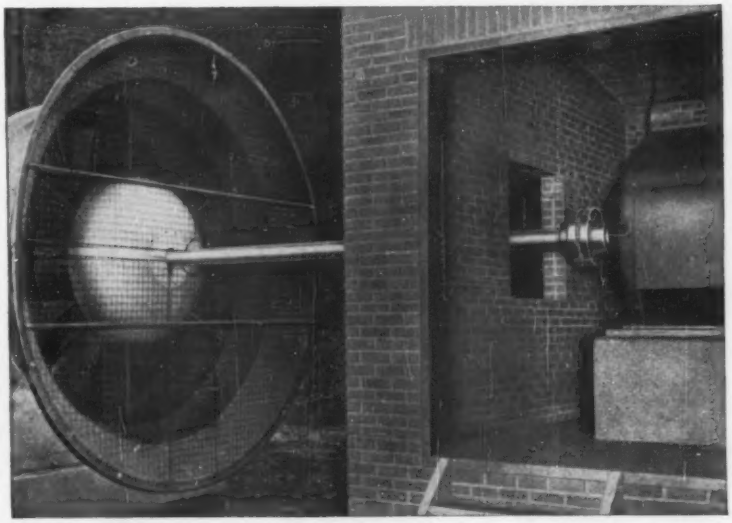
For more data circle No. 40 on postcard, p. 117

Tests bonded coatings

First of a series of new lubrication testing machines now is available. Developed primarily for testing bonded coatings, the new equipment tests liquid lubricants. The relatively small table model is said to not only maintain a high loading accuracy, but also indicates friction forces throughout the test. *The Alpha Molykote Corp.*

For more data circle No. 41 on postcard, p. 117

Eliminate Intermediate Bearings!



By using Thomas Flexible Couplings on long, unsupported shafts, intermediate bearings are eliminated. Thomas engineers tubular shafts free from lateral whip.

The large fan shown above is 16' from the motor to allow sufficient air intake. Miners working underground receive their fresh air supply from this fan and others like it, which have been giving dependable service for as long as fifteen years . . . without shutdowns for lubrication or maintenance of the couplings.

Thomas floating shaft flexible couplings are recommended for machine and marine drives, printing presses, paper and cement mills, cooling towers, diesel engines, pumps, compressors, and many other uses.

Only Thomas Flexible Couplings offer *all* these advantages

UNDER LOAD and MISALIGNMENT

1. Freedom from Backlash—Torsional Rigidity
2. Free End Float
3. Smooth Continuous Drive with Constant Rotational Velocity
4. Visual Inspection in Operation
5. Original Balance for Life

. . . *and*

THOMAS ALL METAL COUPLINGS HAVE NO WEARING PARTS SO LUBRICATION AND MAINTENANCE ARE ELIMINATED

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

New type floor machine removes hard-packed dirt

Operated by one man, a new 25 hp hydraulic floor machine shaves off and picks up grease-caked dirt in a single operation. It propells itself, cleans a 21 in. path in one pass, and has a reported capacity of 4000 to 5000 sq ft per hr. With its concentrated hydraulic pressure and 1600 rpm cleaning tool, it is said to offer powerful floor cleaning action. The operator rides on a rear platform; runs it by simple hand controls. Faucet valves allow sensitive, precise hydraulic speed control (to three mph), forward and reverse action, and pressure on the rotating cleaning cylinder. Cleaning is provided by a heavy gage wire 21 in. brush cylinder revolving at 1600 rpm. Hydraulic cylinders hold the brush against the floor. As it rotates, it shaves off soilage accumulations and hurls the dirt into a built-in hopper. A 2400 rpm fan aids soilage pickup to eliminate after-sweeping. If

operator steps off platform, engine automatically halts. *G. H. Tennant Co.*

For more data circle No. 42 on postcard, p. 117

FOUND WHERE AIRCRAFT POWER AND CONTROLS TAKE SHAPE

GRAND RAPIDS GRINDERS

SUPER SABRE F-100 NORTH AMERICAN AVIATION, INC.

Bendix — BENDIX PRODUCTS DIVISION BENDIX AVIATION CORP.
FAIRCHILD ENGINE DIVISION FAIRCHILD ENGINE AND AIRPLANE CORP.
FORD INSTRUMENT COMPANY DIVISION OF SPERRY RAND CORP.
HAMILTON STANDARD DIVISION UNITED AIRCRAFT CORP.
LEAR, INCORPORATED
ORENDA ENGINES LIMITED
PRATT & WHITNEY AIRCRAFT DIVISION OF UNITED AIRCRAFT CORP.
WRIGHT AERONAUTICAL DIVISION CURTISS-WRIGHT CORP.

Precision is paramount in the manufacture of components for aircraft power and control. That's why these makers of precision parts have Grand Rapids Grinders in their toolrooms — for the utmost in precision grinding.

Model No. 55, for example, features one-piece column and base for permanent vibrationless rigidity. Longitudinal travel table and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. And it's faster than any other grinder of this type and size . . . with variable table speed up to 125 fpm.

With these built-in precision features typical of all Grand Rapids Grinders, it's no wonder they're found in leading toolrooms.

GRAND RAPIDS NO. 55 HYDRAULIC FEED SURFACE GRINDER. Table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head is 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.

A note on your letterhead will bring full details.

GALLMEYER & LIVINGSTON

GALLMEYER & LIVINGSTON COMPANY

400 Straight Ave., S.W., Grand Rapids, Michigan

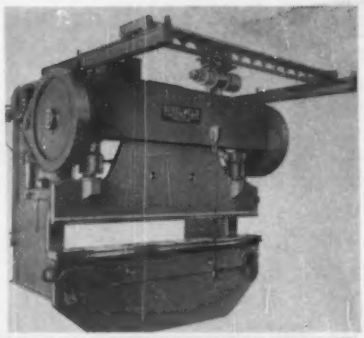
Thickness gage

This completely new ultrasonic thickness measuring instrument is said to reverse present ultrasonic design trends toward either big, console type visual or very small audible equipment. It is portable, weighing only 30 lb, and is designed for heavy use in production testing. Thickness readings are presented via a cathode tube. Its lightweight case is small while its

search cable is five ft long. The three in. presentation tube has an exceptionally bright and clear trace, the maker reports. Light shields are not needed even outdoors. A special clipper circuit eliminates noise. *Magnaflux Corp.*

For more data circle No. 43 on postcard, p. 117

Press brake has built-in crane

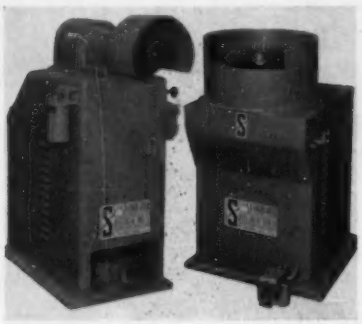


Because of growing demand for overhead equipment for handling heavy plates into the machine, a manufacturer's press brake can now be obtained with a crane built in. The brake illustrated has a three-ton hand propelled crane with electric hoist. The crane is 18 ft long and can be traveled as far as eight ft to the front of the bed center. Brake is so large that it is necessary, because of shipping limitations, to provide a detachable bed which is secured to the machine by resting it on saddles at each end and bolting to the frame. The machine is rated for 20 ft x 5/8 in. mild steel and will handle 16 ft plates between housings. Two speeds are provided: 7 or 21 strokes per minute. Overall dimensions: Length 22 ft-0 in., depth 11 ft-0 in., height 17 ft-2 in. The bed extends 3 ft-8 in. below the floor. *Cleveland Crane & Engineering Co.*

For more data circle No. 44 on postcard, p. 117

Speed lathes

Vertical and horizontal speed chucking lathes are new models available with single, multiple and variable speed motors. They also can be supplied with electric brake motors for starting and stopping a number of times every minute. Special spindle adapters can be supplied. Various



makes of hand or air chucks can be arranged for or supplied with the machines. In the event of an air chuck a foot pedal is standard equipment which simultaneously operates the air chuck and motor in proper sequence. *Standard Electrical Tool Co.*

For more data circle No. 45 on postcard, p. 117

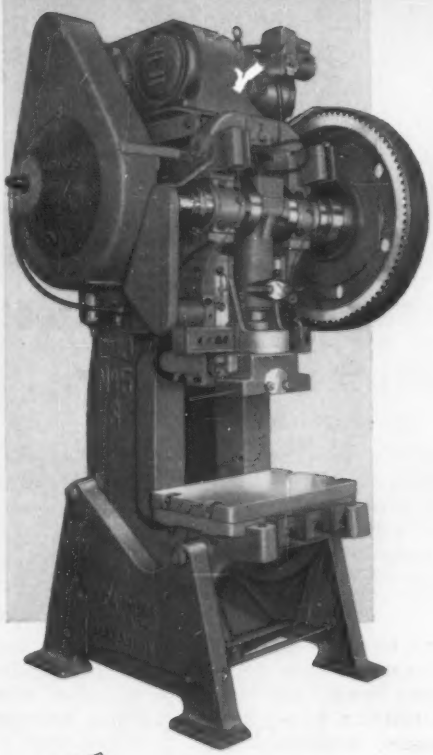
Transfer conveyor

Long cylindrical parts are transferred from one production machine to another with a new elevating transfer conveyor. It accepts parts in a rolling position from discharge chute of the first machine, elevates them and delivers them to the magazine of the next. *Foodall, Inc.*

For more data circle No. 46 on postcard, p. 117

New L&J No. 5 PRESS

Keeps Production Efficient



A completely new 56-ton O.B.I. punch press with the quality, accuracy and versatility to keep production costs down. It combines in a widely adaptable size the proven features that have made L&J Presses popular in all types of press shops.

Exceptional rigidity gives longer die life and precision products. Its ruggedness makes routine work of tough jobs while maintenance is held to a minimum.

This is the press you need for better work at lower costs.

Air clutch on back shaft, variable speed drive and flanged ram optional at extra cost. Non-geared type also available.

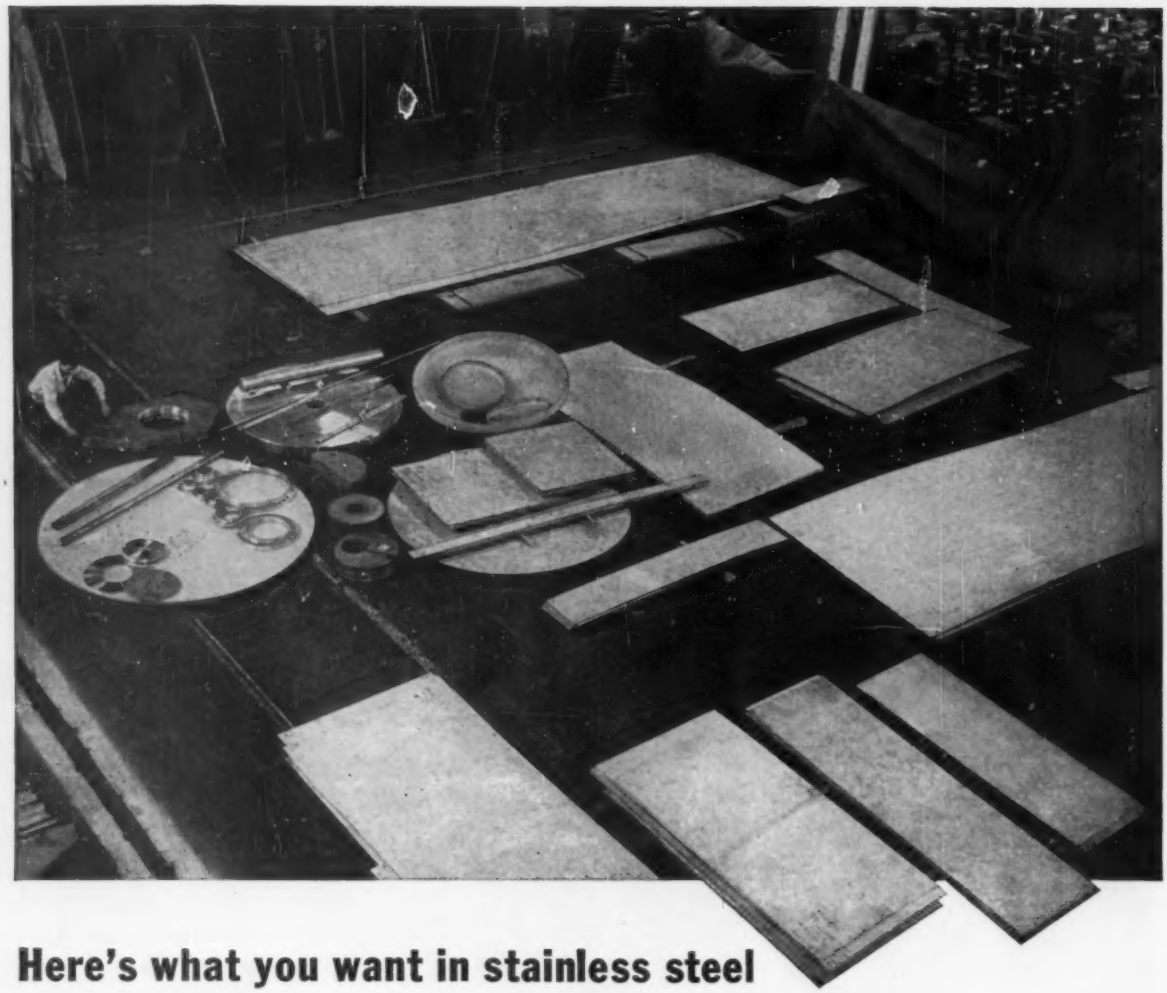
WRITE FOR CATALOG describing all L & J O. B. I. Presses — 20 geared and non-geared models. Capacities 14 to 90 tons. Also, 20 to 50 ton High Speed Straight Side Presses.

Specifications

Capacity—56 tons. Standard stroke—4". Maximum stroke (to order)—6". Strokes per minute—46 (non-geared 95). Die space—11¼" to 18¼", stroke down, adj. up.

L&J Press Corporation

1623 Sterling Ave.
Elkhart, Indiana



Here's what you want in stainless steel —the way you want it

Stainless Steel Plate . . . produced to almost any size or thickness, 3/16" and heavier, in rectangles or cut-to-shape. Carlson maintains what is probably the largest stock of stainless plate in the country—produced to highest chemical and metallurgical standards —ready for cutting to your requirements, and for shipment when you want it.

Stainless Steel Heads . . . spun or press formed to your order or taken directly from our stock of ASME and Standard flanged and dished heads—the *largest stock* maintained anywhere. In addition to supplying heads for tanks, heat exchangers, condensers and similar equipment, Carlson can fill a complete bill of material including shell plates, flanges, rings, pads and other components.

Stainless Steel Forgings, Circles, Rings, and Special Patterns . . . Flanges, circles, rings, and sketch plates are cut from plate, or forged and rough machined to meet your specifications.

Stainless Steel Bars and Sheets (No. 1 Finish)

Complete Service . . . At Carlson the emphasis is on flexibility, efficiency and economy in producing what you want, when you want it. If you would like additional information about our service and products or, if you want *to place an order*—just let us know, we promise you prompt action!

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YOUR GUIDE TO WHAT'S AVAILABLE
IN QUALITY STAINLESS STEEL

Stainless Steels Exclusively

G. O. CARLSON, INC.

THORNDALE, PENNSYLVANIA

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

District Sales Offices in Principal Cities

The Iron Age SUMMARY . . .

Backlash of strike begins to hit consumers . . . News from the mills is bad . . . Maintenance problems compounding drive for more production . . . Automotive demand will hit later.

Pinch Is On . . . Steel consumers are starting to feel the backlash of the steel strike. News from the mills is not good. To make up for production losses, the steel companies are wielding a heavy red pencil on the order books.

Compounding the problems of both users and consumers in the months ahead is the prospect of a slow recovery from the strike in terms of melting and rolling facilities. Maintenance troubles are popping up all over the lot, and will continue to plague producers throughout the year.

Blast furnace operating problems are increasing the pressure on available scrap supply. Some blast furnaces have not yet been brought into production. Others are experiencing premature breakouts and other delays due to the long shutdown. Roof cave-ins in openhearths and electric furnaces are holding down production.

Pressure Mounts . . . Meanwhile, the pressure from consumers is mounting. Automotive is out of the picture during the model changeover period from a heavy volume standpoint. But the automakers are still taking in steel. And the heat will be on again beginning in October.

The procurement problem in plate and structurals is desperate. Some buyers have been told they will get structurals rdered for July-August delivery but can expect nothing else for the balance of the year.

Most steel producers feel the industry will be operating at high levels well into next year—perhaps as far as May or June. This takes into account seasonal and growth demand, plus renewed inventory building in the first half of 1957. Part of this buildup will be a hedge against higher steel prices expected to be effective next July 1—if not before.

Construction Hurt . . . There are indications that the strike after-effects will pinch most late this month and in September. Construction slowdowns, curtailed drillings in the oil fields, and dwindling steel inventories in the hands of heavy equipment makers add up to a gloomy supply outlook.

The scrap picture is being knocked out of focus as the mills try to give the impression they don't need the scrap, while scrap people know they need it. The resultant tug-of-war has created some hard feelings and record high prices. Heavy export demand, particularly from Japan, is adding fuel to the fire.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
Net tons, 000 omitted)	2,363	2,154	406	2,186
Ingot Index				
(1947-1949=100)	147.1	134.1	25.2	136.1
Operating Rates				
Chicago	101.5	87.0*	6.0	95.5
Pittsburgh	97.0	91.0	7.0	95.0
Philadelphia	96.0	77.0*	0.0	81.0
Valley	89.0	73.0*	13.0	93.0
West	95.0	92.0*	25.0	97.0
Detroit	95.0	80.0*	55.0	57.0
Buffalo	107.0	95.0	0.0	100.0
Cleveland	102.0	97.5*	0.0	96.5
Birmingham	87.0	60.0	3.5	95.0
S. Ohio River	85.0	86.0*	71.0	90.0
Upper Ohio R.	97.0	96.0*	55.0	95.0
St. Louis	92.0	102.0	95.0	104.0
Northeast	100.0	55.0	47.0	81.5
Aggregate	96.0	87.5	16.5	91.0

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.622	5.622*	5.179	5.174
Pig Iron (Gross Ton)	$63.15	$63.15	$60.61	$59.09
Scrap, No. 1 hvy (gross ton)	$57.50	$56.83	$49.50	$43.83
Nonferrous				
Aluminum ingot	25.90	25.90	25.90	23.20
Copper, electrolytic	46.00	46.00	46.00	36.00
Lead, St. Louis	15.80	15.80	15.80	12.50
Magnesium	34.50	34.50	34.50	29.25
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	98.75	98.625	95.75	96.00
Zinc, E. St. Louis	13.50	13.50	13.50	12.50

*Revised

Warehouses Join Price Upswing

Advances reported on structurals, bar, plate, sheets, strip, and bars . . . Supply picture darkens as mills place ban on some fourth quarter orders . . . Spring steels are up.

◆ PRICES on sheets, strip, plates, shapes and carbon and alloy bars were increased by warehouses this week in line with the recent upward revisions made by producers.

Changes were made by one distributor, Joseph T. Ryerson & Son, Inc. at Chicago, New York, St. Louis, Detroit, Buffalo, Cincinnati, Boston, Cleveland, Philadelphia, Milwaukee, Pittsburgh, Los Angeles, San Francisco, Seattle, Spokane. (See Page 151.)

While warehouse increases varied depending upon the item and the location the following new prices for Ryerson at New York are typical. (in cents per 100 lb.)

Structural shapes 8.84; hot rolled bars (merchant) 8.93; hot rolled bars (special quality) 9.48; hot rolled strip 8.91; hot rolled plates 8.88; hot rolled sheets 8.45; cold rolled sheets 9.63; and cold rolled carbon bars 10.71.

Crucible Steel Co. of America, Spring Div., announced new prices effective Aug. 15. They were: hot wound carbon steel helical compression springs now $12.10 per 100 lb and elliptic and semi-elliptic carbon steel springs, plain design now $15.70 per 100 lb.

Inland Steel Container Co., Div. of Inland Steel Co., made increases of slightly less than 10 pct on steel drums and pails, effective Aug. 15.

The supply picture for mill products continues to darken, as some mills indicate they will book no orders for all of October and part of November for plate, structurals, sheet, strip and bars. Pipe and tubing are also tight with contractors stacking oil country goods and producers unable to increase production. No short term solution is in sight.

PLATE AND STRUCTURALS . . . One **Pittsburgh** producer will probably blank out one and a half months in the fourth quarter. This would mean no orders booked for all of October and a good part of November. Situation is aggravated by military set-asides, which are large in plate and structurals. The mills have been directed to clear up August military tonnage by the end of September and September's as soon as possible after that. Military quotas will continue in October although normal orders will not be accepted for this period. All of which increases the cutbacks that must be spread among civilian users. The plate and structural situation is becoming more impossible in **Detroit**. Warehouses were cleaned out during the strike and maintenance problems have plagued the mills since the settlement.

SHEETS AND STRIP . . . **Cleveland** mills report flat-rolled users are taking all the steel they can get. Orders booked earlier are standing up. Without taking any new orders, the mills have business to keep them busy well into the fourth quarter. One producer is advising all districts that fourth quarter quotas will be cut in half. Automakers are sending in their specifications for new model steel but still have not made their full commitments. However, in **Detroit**, the pinch is probably being felt less in sheets and strip than in other products. Best off is cold rolled sheet and strip; then comes hot-rolled. Most mills are at least 6 weeks behind. Steel strike effects will cause one **Pittsburgh** producer to drop the month of October and probably part of November from the books. Current uncertainty on delivery makes it difficult to gage demand. Increasing the extra for normalizing on enamelling iron has encouraged **Chicago area** output of this product, which has been scarce for almost two years. A few suppliers have offered to allow customers to switch cold rolled sheet allotments into annealing iron. Hot rolled sheet is beginning to look like an extremely tough item for October and November.

BARS . . . Hot rolled bar producers in **Chicago** will drop from one month's to one-and-one-half months' tonnage or carry it over, trying to catch up before the end of the year. They'll reduce quotas somewhat to catch up, but as they already had carryovers when the strike began of one to two weeks, they'll probably end up dropping the tonnage entirely. Demand is strictly for hot rolled, so there has been little pickup in cold finished since the strike ended. Meanwhile in **Detroit** bars are becoming extremely tight. This is especially true of carbon bars and forging quality bars. The pinch is beginning to show. Orders are coming in and mills are anywhere from 7 to 8 weeks behind already. On the **West Coast** bars are on a temporary allocation basis.

WAREHOUSES . . . A **Pittsburgh** warehouse reports that a few cars of plates and structurals have trickled in. Apart from these products warehouse inventories are in good, workable condition. There are spot shortages in hot rolled bars; a lively demand has kept hot rolled sheets tight; but cold finished bars, cold rolled sheets, and galvanized sheets are in plentiful supply. A **Cleveland** warehouse says the complete lack of plate and structurals is slowing work generally and cutting into demand for bars and other products. Demand for flat rolled products is steady but not overpowering. Inventories are in good shape. Business in **Chicago** continues for general line houses to run below July levels. In some cases the dropoff running to 35 and even 50 pct below last month's levels. On the other hand, warehousemen must be counting on a fairly heavy November.

Purchasing Agent's Checklist

SPECIAL REPORT: Why scrap prices hit the ceiling . . . . . p. 55

MARKETING: Blackened stainless sheet stages comeback . . . . . p. 59

WASHINGTON: Government will release more marketing data . . p. 77

TECHNICAL: Hopper feeds for small plant automation . . . . p. 95

Comparison of Prices

(Effective Aug. 21, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Aug. 21 1956	Aug. 14 1956	July 24 1956	Aug. 23 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.325¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.325	5.325
Galvanized sheets (10 ga.)	6.30	6.30	5.85	5.85
Hot-rolled strip	4.669	4.668	4.325	4.325
Cold-rolled strip	6.870	6.883	6.28	6.29
Plate	4.87	4.87	4.52	4.52
Plates, wrought iron	10.40	10.40	10.40	9.30
Stainl's C-R strip (No. 302)	47.50	47.50	44.50	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.85	$9.85	$9.85	$9.05
Tinplates, electro (0.50 lb.)	8.55	8.55	8.55	7.75
Special coated mfg. ternes	9.10	9.10	9.10	7.85
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	4.65¢	4.65¢
Cold finished bars	6.85	6.85	6.25	5.90
Alloy bars	6.125	6.125	5.575	5.65
Structural shapes	5.00	5.00	4.60	4.60
Stainless bars (No. 302)	40.75	40.75	38.25	38.25
Wrought iron bars	11.50	11.50	11.50	10.40
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	6.60¢	6.25¢
Rails: (per 100 lb.)				
Heavy rails	$5.075	$5.075	$4.725	$4.725
Light rails	6.00	6.00	5.65	5.65
Semifinish Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$68.50	$68.50
Slabs, rerolling	74.00	74.00	68.50	68.50
Forging billets	91.50	91.50	84.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	96.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.025¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.622¢	5.622¢*	5.179¢	5.174¢

	Aug. 21 1956	Aug. 14 1956	July 24 1956	Aug. 23 1955
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$67.76	$67.76	$66.51	$63.69
Foundry, Valley	63.00	63.00	60.50	59.00
Foundry, Southern Cin'ti	67.17**	66.93	62.93	62.93
Foundry, Birmingham	59.00	59.00	57.67	55.00
Foundry, Chicago	63.00	63.00	63.00	59.00
Basic del'd Philadelphia	66.84**	66.98	65.73	62.77
Basic, Valley furnace	62.50	62.50	60.00	58.50
Malleable, Chicago	63.00	63.00	63.00	59.00
Malleable, Valley	63.00	63.00	60.50	59.00
Ferromanganese, cents per lb.‡ 74 to 76 pct Mn base.	10.75¢	10.75¢	9.50¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$63.15	$63.15	$60.61	$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$57.50	$57.50	$50.50	$44.50
No. 1 steel, Phila. area	57.50	56.50	51.50	46.50
No. 1 steel, Chicago	57.50	56.50	46.50	40.50
No. 1 bundles, Detroit	54.50	54.50	41.50	38.50
Low phos., Youngstown	65.50	65.50	54.50	46.50
No. 1 mach'y cast, Pittsburgh	60.50	60.50	54.50	44.50
No. 1 mach'y cast, Philadel'a	57.50	57.50	54.50	46.50
No. 1 mach'y cast, Chicago	59.50	59.50	49.50	52.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$57.50	$56.83	$49.50	$43.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50	$14.50	$14.50	$13.25
Foundry coke, prompt	17-18	17.50	17.50	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	40.00	40.00	46.00	36.00
Copper, Lake, Conn.	40.00	40.00	46.00	36.00
Tin, Straits, New York	98.75†	98.625	95.75	96.00
Zinc, East St. Louis	13.50	13.50	13.50	12.50
Lead, St. Louis	15.80	15.80	15.80	14.80
Aluminum, virgin ingot	25.90	25.90	25.90	23.20
Nickel, electrolytic	64.50	64.50	64.50	67.67
Magnesium, ingot	34.50	34.50	34.50	29.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50

† Tentative. ‡ Average. * Revised. ** Reflects Freight Revision.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on p. 150→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	64.50	65.00	65.50	66.00	.....
Birdsboro, Pa. *B6*	64.50	65.00	65.50	66.00	.....
Birmingham *R3*	58.50	59.00	.....	.....	.....
Birmingham *W9*	58.50	59.00	63.00	.....	.....
Birmingham *U4*	58.50	59.00	63.00	.....	.....
Buffalo *R3*	62.50	63.00	63.50	64.00	.....
Buffalo *H1*	62.50	63.00	63.50	.....	.....
Buffalo *W6*	64.50	65.00	65.50	66.00	.....
Chester *P2*	64.50	65.00	65.50	.....	.....
Chicago *I4*	62.50	63.00	63.00	63.50	.....
Cleveland *A5*	62.50	63.00	63.00	63.50	67.50
Cleveland *R3*	62.50	63.00	63.00	63.50	.....
Duluth *I4*	62.50	63.00	63.00	63.50	67.50‡
Erie *I4*	62.50	63.00	63.00	63.50	67.50‡
Everett *M6*	.....	63.75	64.25	.....	.....
Fontana *K1*	70.00	70.50	.....	.....	.....
Geneva, Utah *C7*	60.00	60.50	.....	.....	.....
Granite City *G2*	64.40	64.90	65.40	.....	.....
Hubbard *Y1*	.....	.....	63.00	.....	.....
Lone Star *L3*	.....	55.00	.....	.....	.....
Midland *C11*	60.00	.....	.....	.....	.....
Minnequa *C6*	64.50	65.00	65.50	.....	.....
Monessen *P6*	60.00	.....	.....	.....	.....
Neville Is. *P4*	62.50	63.00	63.00	63.50	67.50†
N. Tonawanda *T1*	.....	63.00	63.50	64.00	.....
Pittsburgh *U1*	62.50	.....	63.00	63.50	.....
Sharpsville *S3*	62.50	63.00	63.00	63.50	.....
So. Chicago *R3*	62.50	63.00	63.00	.....	.....
Steelton *B3*	64.50	65.00	65.50	66.00	70.50
Swedeland *A2*	64.50	65.00	65.50	65.50	.....
Toledo *I4*	62.50	63.00	63.00	63.50	.....
Troy, N. Y. *R3*	64.50	65.00	65.50	66.00	70.50
Youngstown *Y1*	62.50	63.00	63.00	63.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos.

Silvery Iron: Buffalo, *H1*, $72.50; Jackson, *J1*, *I4*, $71.00. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 14 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon: $64.00.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

Product	201	202	301	302	303	304	316	321	348	410	416	430
Ingots, rerull.	19.75	21.00	20.50	22.00	—	23.25	35.25	28.25	37.50	16.00	27.75	16.25
Slabs, billets, rerull.	24.50	27.25	25.25	28.00	28.50	29.25	44.50	35.75	47.50	20.75	—	21.00
Billets, forging	—	33.00	—	34.00	37.00	36.00	56.25	42.25	56.00	27.25	—	27.75
Bars, struct.	—	39.25	40.50	40.75	43.75	43.00	66.75	50.25	66.00	32.50	33.00	33.00
Plates	—	41.25	—	43.00	—	45.75	70.25	54.50	71.00	33.75	—	34.50
Sheets	45.00	45.25	47.25	47.50	—	50.25	74.75	60.00	80.25	38.75	—	39.25
Strip, hot-rolled	33.00	35.75	34.00	36.75	—	39.75	63.50	48.75	65.25	29.75	—	30.75
Strip, cold-rolled	31.50	45.25	43.75	47.50	—	50.25	74.75	60.00	80.25	38.75	—	39.25
Wire CF; Rod HR	—	—	38.50	38.75	41.75	41.00	63.75	48.00	63.00	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2* (2.25¢ lower on Type 430), *J2*; Baltimore, *E1*; Middletown, O., *A7*) Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

Another New Price Record

Bullish market continues record climb . . . Few signs of leveling off are observed . . . September auto lists may show future trend of market . . . Export prices up.

◆ HAS SCRAP just about reached the peak of its post strike climb? On the surface, prices don't indicate it. THE IRON AGE Composite rose again, maintaining its climb into the area where each upward move represents an all time high.

Some of the most recent movements indicate some leveling off. Current prices are bringing in adequate supplies in some areas. In others, mills are determined not to let prices get out of hand.

But there is little indication of any sharp drop anywhere. Inventories are not high in any market area, but are considered low in most districts. In Chicago, for example, mills are fighting a defensive battle, but see scrap leaving the area despite their own low stocks.

On East and West Coasts, export is bulling the market. This extends to the South, where higher prices for September and October export are already announced.

Detroit auto lists can't be expected to rise before September, when new model production starts its upsurge. Until then, choice bundles from industrial lists will bring premium prices.

Bidding for the September auto lists should give an indication of how the market will progress. If prices are above this months' record figures, dealer scrap will soar even higher than the present record. But less frantic bidding may restore some order to the market.

Also of some concern is the strike of the Pittsburgh Steamship Div. of U. S. Steel. This maritime strike tied up the largest Lakes fleet, aggravating the danger of an ore famine brought on by the recent steel strike.

Pittsburgh . . . Openhearth scrap is no more plentiful here and dealers are shipping slowly as nothing can be pulled in from out of the district. Brokers are reported to be quoting as high as $58 to $59 to dealers in anticipation of expected mill purchases. Blast furnace grades continue to hold at old levels with the mills out of the market and brokers unwilling to bid prices up. Cast grades are strong with small foundry buys confirming going prices. A respectable tonnage of low phos also moved at current price.

Philadelphia . . . Mills are still trying to keep out of the buying picture, but representative purchase drove prices $1 higher for steelmaking and blast furnace grades. Competition between brokers and foreign buyers is putting more pressure on prices and might cause them to go higher. Yard intakes vary from fair to good, but not enough to ease the situation. There are few, if any, signs of stability and dealers for the most part must be content with filling old orders.

Chicago . . . Scrap in heavy tonnages continues to move out of the area, with acute shortages developing, particularly in some of the railroad grades. Strong consumer resistance failed to halt slight increases during the week, although spot sales of material at slightly below top levels were reported in increasing quantity. Reroller axles and rail are in short supply. Electric furnace consumers obtained some material at slightly lower prices during the week, but in small quantity. Generally speaking, the movement of scrap at slightly weaker prices is regarded as a temporary reaction to mill resistance, not an indication of a sagging market. Inventories are low.

New York . . . Currently, it is the export demand that is preventing this market from leveling off. Mill demand from neighboring areas is good, but not unusual. Export transaction pushed the price of steelmaking grades up $1, to $52 for No. 1 heavy melting.

Detroit . . . Although scrap continues in extremely short supply, the local market seems to be marking time and waiting for announcement of new lists late this week. In the long term, it is expected that prices will show further increases, in view of the relatively strong demand.

Cleveland . . . Prices are unchanged and there has been no broker or mill activity at higher prices. One Valley mill has had to slow down incoming shipments of scrap because they were arriving too fast. On the other hand, brokers report they have had little success buying scrap at profitable prices or large quantities.

Birmingham . . . The market here is relatively quiet. The only change was brought about by exporters who have raised their prices $3 on both No. 1 and No. 2 steel grades for late September-October shipment. Electric furnace grades and cast iron remain steady.

St. Louis . . . The market continues strong, with prices unchanged except for No. 1 bundles, which advanced $1 to equal the price of No. 1 heavy melting. Higher prices have brought out a steady flow of scrap and little change in price is expected.

Cincinnati . . . Market here has tightened after a brief period in which there was talk of weakness. New firmness is attributed to reports of an ore shortage because of work stoppages. Cast grades are up from $1 to $3.

Buffalo . . . The market remains quiet, with no new purchases to disturb price levels. Low phos price climbed, re-establishing the differential between it and No. 1 steelmaking grades.

Boston . . . The market is marking time, with some brokers having filled their commitments at going prices. Export is at a standstill, at least temporarily. Prices of No. 1 bundles and No. 1 busheling both should have been quoted at $50.50 to $51.50 in Aug. 16 issue.

West Coast . . . Demand for scrap is terrific. Despite two consecutive weeks of price boosts, pressure for further increase seems to be mounting in all major markets.

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Scrap Prices *(Effective Aug. 21, 1956)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$57.00 to $58.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 bundles	57.00 to 58.00
No. 2 bundles	45.00 to 46.00
Machine shop turn.	38.00 to 39.00
Mixed bor. and ms. turn.	38.00 to 39.00
Shoveling turnings	42.00 to 43.00
Cast iron borings	42.00 to 43.00
Low phos. punch'gs plate	67.00 to 68.00
Heavy turnings	52.00 to 53.00
No. 1 RR. hvy. melting	67.00 to 68.00
Scrap rails, random lgth.	72.00 to 73.00
Rails 2 ft and under	75.00 to 76.00
RR. steel wheels	73.00 to 74.00
RR. spring steel	73.00 to 74.00
RR. couplers and knuckles	73.00 to 74.00
No. 1 machinery cast	60.00 to 61.00
Cupola cast	53.00 to 54.00
Heavy breakable cast.	51.00 to 52.00

Chicago

No. 1 hvy. melting	$57.00 to $58.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 factory bundles	63.00 to 65.00
No. 1 dealers' bundles	57.00 to 58.00
No. 2 dealers' bundles	43.00 to 44.00
Machine shop turn.	33.00 to 35.00
Mixed bor. and turn.	35.00 to 36.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	35.00 to 36.00
Low phos. forge crops	72.00 to 73.00
Low phos. punch'gs plate	69.00 to 70.00
Low phos. 3 ft and under	67.00 to 68.00
No. 1 RR. hvy. melting	62.00 to 64.00
Scrap rails, random lgth.	73.00 to 74.00
Rerolling rails	84.00 to 85.00
Rails 2 ft and under	82.00 to 83.00
Locomotive tires, cut	68.00 to 69.00
Cut bolsters & side frames	68.00 to 69.00
Angles and splice bars	73.00 to 74.00
RR. steel car axles	87.00 to 88.00
RR. couplers and knuckles	67.00 to 68.00
No. 1 machine cast	59.00 to 60.00
Cupola cast	55.00 to 56.00
Heavy breakable cast.	48.00 to 49.00
Cast iron brake shoe	49.00 to 50.00
Cast iron wheel	60.00 to 61.00
Malleable	72.00 to 73.00
Stove plate	50.00 to 51.00
Steel car wheels	68.00 to 69.00

Philadelphia Area

No. 1 hvy. melting	$57.00 to $58.00
No. 2 hvy. melting	48.00 to 49.00
No. 1 bundles	57.00 to 58.00
No. 2 bundles	46.00 to 47.00
Machine shop turn.	39.00 to 40.00
Mixed bor. short turn.	38.00 to 39.00
Cast iron borings	40.00 to 41.00
Shoveling turnings	43.00 to 44.00
Clean cast chem. borings	43.00 to 44.00
Low phos. 5 ft and under	59.00 to 60.00
Low phos. 2 ft and under	61.00 to 62.00
Low phos. punch'gs	61.00 to 62.00
Elec. furnace bundles	58.00 to 59.00
Heavy turnings	52.00 to 53.00
RR. steel wheels	66.00 to 67.00
RR. spring steel	63.00 to 64.00
Rails 18 in. and under	70.00 to 71.00
Cupola cast	53.00 to 54.00
Heavy breakable cast.	54.00 to 55.00
Cast iron car wheels	64.00 to 65.00
Malleable	68.00 to 69.00
Unstripped motor blocks	35.00 to 36.00
No. 1 machinery cast	57.00 to 58.00

Cleveland

No. 1 hvy. melting	$61.50 to $62.50
No. 2 hvy. melting	47.00 to 48.00
No. 1 bundles	61.50 to 62.50
No. 2 bundles	40.00 to 41.00
No. 1 busheling	61.50 to 62.50
Machine shop turn.	32.50 to 33.50
Mixed bor. and turn.	38.00 to 39.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Cut struct'r'l & plates, 2 ft & under	67.00 to 68.00
Drop forge flashings	62.50 to 63.50
Low phos. punch'gs, plate	62.50 to 63.50
Foundry steel, 2 ft & under	56.00 to 57.00
No. 1 RR. heavy melting	66.00 to 67.00
Rails 2 ft and under	79.00 to 80.00
Rails 18 in. and under	80.00 to 81.00
Railroad grate bars	47.00 to 48.00
Steel axle turnings	44.00 to 45.00
Railroad cast	59.00 to 60.00
No. 1 machinery cast	57.00 to 58.00
Stove plate	53.00 to 54.00
Malleable	69.00 to 70.00

Youngstown

No. 1 hvy. melting	$64.00 to $65.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 bundles	64.00 to 65.00
No. 2 bundles	43.00 to 44.00
Machine shop turn.	34.00 to 35.00
Shoveling turnings	39.00 to 40.00
Cast iron borings	39.00 to 40.00
Low phos. plate	65.00 to 66.00

Buffalo

No. 1 hvy. melting	$54.00 to $55.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 busheling	54.00 to 55.00
No. 1 bundles	54.00 to 55.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	32.00 to 33.00
Low phos. plate	59.00 to 60.00
Scrap rails, random lgth.	57.00 to 58.00
Rails 2 ft and under	65.00 to 66.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	62.00 to 63.00
No. 1 machinery cast	52.00 to 53.00
No. 1 cupola cast	48.00 to 49.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$53.00 to $54.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles, openhearth	54.00 to 55.00
No. 2 bundles	35.00 to 36.00
New busheling	53.00 to 54.00
Drop forge flashings	52.50 to 53.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	53.00 to 54.00
No. 1 cupola cast	51.00 to 52.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast	54.00 to 55.00

St. Louis

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	51.00 to 52.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	32.00 to 33.00
Cast iron borings	33.00 to 34.00
Shoveling turnings	33.00 to 34.00
No. 1 RR. hvy. melting	61.50 to 62.50
Rails, random lengths	75.00 to 76.00
Rails 18 in. and under	75.00 to 76.00
Locomotive tires uncut	62.00 to 63.00
Angles and splice bars	64.00 to 65.00
Std. steel car axles	76.00 to 77.00
RR. specialties	65.00 to 66.00
Cupola cast	54.00 to 55.00
Heavy breakable cast.	45.00 to 46.00
Cast iron brake shoes	50.00 to 51.00
Stove plate	48.00 to 49.00
Cast iron car wheels	53.00 to 54.00
Rerolling rails	78.00 to 79.00
Unstripped motor blocks	44.00 to 45.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$50.50 to $51.50
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	50.50 to 51.50
No. 2 bundles	38.00 to 39.00
No. 1 busheling	50.50 to 51.50
Elec. furnace, 3 ft & under	53.00 to 54.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and short turn.	28.00 to 29.00
Shoveling turnings	31.00 to 32.00
Clean cast chem. borings	31.00 to 32.00
No. 1 machinery cast	45.00 to 46.00
Mixed cupola cast	41.00 to 42.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	38.00 to 39.00
Unstripped motor blocks	32.00 to 33.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	42.00 to 43.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	34.00 to 35.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast	49.00 to 50.00
Mixed yard cast	45.00 to 46.00
Charging box cast	45.00 to 46.00
Heavy breakable cast.	45.00 to 46.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	29.00 to 30.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	25.00 to 26.00
Electric furnace bundles	51.00 to 52.00
Bar crops and plate	55.00 to 56.00
Structural and plate, 2 ft	54.00 to 55.00
No. 1 RR. hvy. melting	50.00 to 51.00
Scrap rails, random lgth.	61.00 to 62.00
Rails, 18 in. and under	65.00 to 66.00
Angles & splice bars	61.00 to 62.00
Rerolling rails	71.00 to 72.00
No. 1 cupola cast	51.00 to 52.00
Stove plate	49.00 to 50.00
Charging box cast	38.00 to 39.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	41.00 to 42.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$54.50 to $55.50
No. 2 hvy. melting	45.00 to 46.00
No. 1 bundles	54.50 to 55.50
No. 2 bundles	42.00 to 43.00
Machine shop turn.	32.50 to 33.50
Mixed bor. and turn.	34.50 to 35.50
Shoveling turnings	35.50 to 36.50
Cast iron borings	34.50 to 35.50
Low phos. 18 in. & under	59.00 to 60.00
Rails, random lengths	65.00 to 66.00
Rails, 18 in. and under	74.00 to 75.00
No. 1 cupola cast	47.00 to 48.00
Hvy. breakable cast.	47.00 to 48.00
Drop broken cast.	58.00 to 59.00

San Francisco

No. 1 hvy. melting	$46.00
No. 2 hvy. melting	43.00
No. 1 bundles	44.00
No. 2 bundles	35.00
No. 3 bundles	29.00
Machine shop turn.	27.00
Cast iron borings	25.00
No. 1 RR. hvy. melting	46.00
No. 1 cupola cast	52.00

Los Angeles

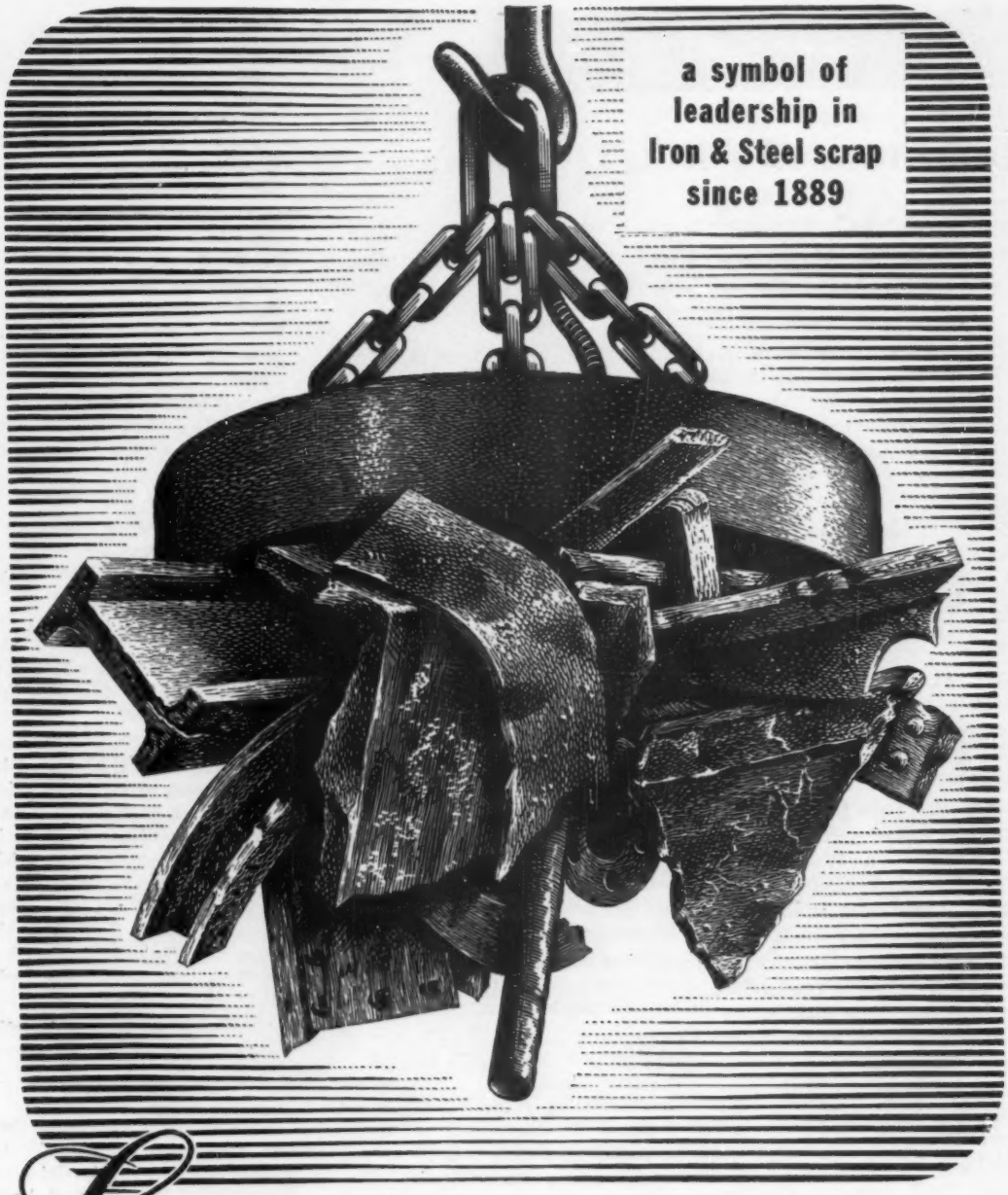
No. 1 hvy. melting	$46.00
No. 2 hvy. melting	44.00
No. 1 bundles	45.00
No. 2 bundles	35.00
No. 3 bundles	33.00
Machine shop turn.	27.00
Shoveling turnings	25.00
Cast iron borings	24.00
Elec. furn. 1 ft and under	47.00
No. 1 RR. hvy. melting	46.00
No. 1 cupola cast	47.00

Seattle

No. 1 hvy. melting	$46.00
No. 2 hvy. melting	42.00
No. 2 bundles	31.00
No. 3 bundles	27.00
No. 1 cupola cast	45.00
Mixed yard cast	45.00

Hamilton, Ont.

No. 1 hvy. melting	$49.00
No. 2 hvy. melting	44.00
No. 1 bundles	49.00
No. 2 bundles	41.50
Mixed steel scrap	43.00
Bushelings	39.50
Bush., new fact., prep'd	47.00
Bush., new fact., unprep'd	43.00
Machine shop turn.	28.00
Short steel turn.	34.00
Mixed bor. and turn.	34.00
Rails, rerolling	57.00
Cast scrap	50.00



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Aluminum Market Tightens

Looks like you won't get what you want, when you want it for rest of the year . . . Olin Mathieson, Revere talking over possibility of primary production.

◆ ALUMINUM consumers are discovering that the aluminum strike has made a tight market even tighter. The current outlook is that users will have trouble getting the specific size and shape mill products they want, when they want it for the rest of 1956.

Aluminum Co. of America had four smelters closed down for eight days—Alcoa, Tenn.; Baden, N. C.; Rockdale and Point Comfort, Tex. Total loss of output amounted to close to 40,000 tons, of which 67 pct came during the buildup period following settlement.

Reynolds Metals Co. also has lost production from four smelters —Troutdale, Ore.; San Patricio, Tex.; Arkadelphia and Jones Mills, Ark. Total primary aluminum capacity of these installations is close to 6500 tons per week.

Total is sure to derail the industry's monthly primary production rate, which has been highballing along at a record-breaking clip for most of 1956.

On the brighter side, Olin Mathieson Chemical Corp. and Revere Copper & Brass Co. are currently negotiating with the aim of setting up a third company for the production of primary aluminum.

O-M already has definite plans for the construction of facilities in the Ohio Valley with annual capacity of 60,000 tons. If current talks materialize, the output of the third company would be in the vicinity of about 180,000 tons. Of this, about 60,000 tons would be set aside for Revere.

It is not clear whether Revere will join in the construction of facilities for the entire amount or just the 120,000 tons over the current O-M plans. But at any rate, it is another step toward closing the gap between demand and production of aluminum.

MARKETS . . . In a recent address before the Montana State Press Assn., at Livingston, Mont., Roy H. Glover, chairman of the board of the Anaconda Co., revealed a breakdown of his company's copper markets.

Earlier, Aluminum Co. of America released an estimate of the markets for its aluminum.

The statistics indicate several markets which depend upon both metals to a comparable extent:

ALUMINUM MARKETS (Alcoa)	
Building products	24 pct
Transportation usages	20 pct
Consumer durable goods	15 pct
Electrical machinery and equipment, power transmission	10 pct
Other machinery and equipment	8.5 pct
Containers and packaging	4.5 pct
Miscellaneous	18 pct

COPPER MARKETS (Anaconda)	
Military and Naval	13.9 pct
Construction and building	12.9 pct
General components (machine tools, valves, screw machine products, etc.)	10.3 pct
Electrical equipment	10.5 pct
Motor vehicles	8.5 pct
Light and power engines and turbines	4.9 pct
Communication equipment (telephone, telegraph)	4.2 pct
Consumer durable goods	4.5 pct
Railroad equipment	3.1 pct
Scientific, technical equipment	3 pct
General industrial equipment	2.9 pct
Electronic devices	2 pct
Metalworking equipment	1.5 pct
Miscellaneous	17.8 pct

COPPER . . . The Defense Council of the Ingot Brass and Bronze Industry reports that combined shipments for the last reported month, July, were 17,364 tons, down from the 18,842 tons produced the previous month and 18,513 tons turned out in June 1955. This output was the lowest since July 1954.

Brass mills indicate they expect to start to pull out of the doldrums within a week or so. Sales which had sunk as much as 25 pct in some cases because of the impending cut in the copper price and the substantial consumer inventories, show definite signs of picking up. Automotive manufacturers are expected to start placing orders for delivery in the fourth quarter. This would definitely mark the end of the slack sales period.

Mills are backing up their optimism by increasing their purchases of copper.

NICKEL . . . Answer to the current nickel shortage may lie in the undeveloped deposits in Cuba. A report by ODM indicates that American and Canadian mines will have to be bolstered by Cuban resources in view of increasing demand. Shortage is expected to reach 30 million pounds this year. ODM recommends that the number of nickel producers be increased so that national stockpile quotas may be achieved. Congress has called for a final report on the nickel situation by Dec. 31, 1956.

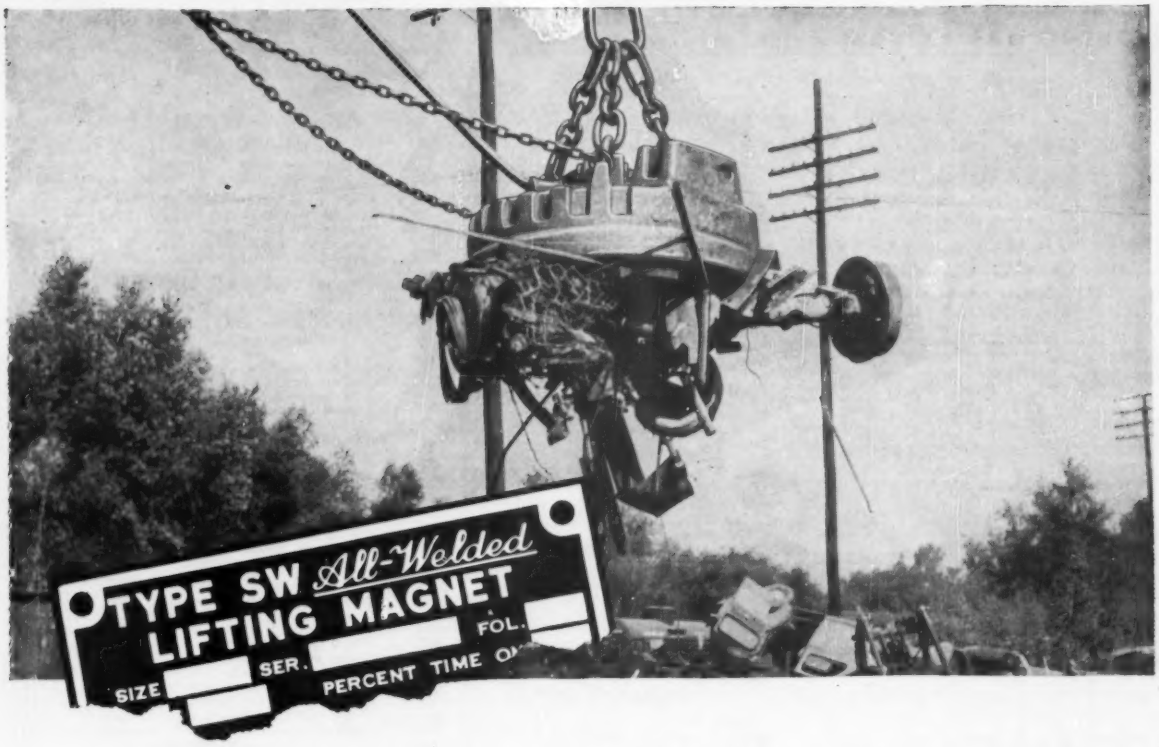
ZINC . . . Steel mill purchases of prime western grade accounted for a fair volume of business this week. But producers must wait until 1957 automobile models get into full production next month before improvement is shown in special high grade.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Aug. 15	Aug. 16	Aug. 17	Aug. 18	Aug. 20	Aug. 21
Copper, electro, Conn.	40.00	40.00	40.00	40.00	40.00	40.00
Copper, Lake, delivered	40.00	40.00	40.00	40.00	40.00	40.00
Tin, Straits, New York	98.625	98.875	98.875	....	98.75	98.75*
Zinc, East St. Louis	13.50	13.50	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80	15.80	15.80

Note: Quotations are going prices. **Tentative*



More Features of EC&M TYPE SW ALL-WELDED LIFTING MAGNETS Assure More Dollar Value

EC&M Type SW ALL-WELDED Lifting Magnets have a new look . . . inside as well as outside. Stronger, better designed to withstand the hard knocks encountered in magnet operation, they are easier to maneuver, and through high lifting capacity they reduce handling costs.

The magnet-coil is wound between turns with purer, thinner asbestos tape, with its strength increased by impregnation with EC&M No. 281 compound. Between layers, the insulation is a new product—ECAMICA board which is moisture-free, has high dielectric strength and excellent mechanical ability. A new fabricating process locks the windings against movement.

Look at the features pictured here in the top and bottom views of the magnet. Remember, too, that these EC&M magnets are ALL-WELDED to keep pole shoes tight—to keep moisture out—to increase the efficiency of the magnetic circuit and to prolong magnet life.

write for bulletin 900

SQUARE D COMPANY

EC & M DIVISION • CLEVELAND 28, OHIO

Nonferrous Prices *(Effective Aug. 21, 1956*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1800,1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6– 8	45.5–47.3	61.3–65.1
12–14	46.2–47.7	62.2–66.8
24–26	49.4–49.5	73.1–77.8
36–38	58.3–59.0	97.4–101.0

Screw Machine Stock—2011-T-3

Size*	¼	⅜–⅝	¾–1	1¼–1½
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	98	120	144
.019 gage	$1.352	$1.803	$2.254	$2.704
.024 gage	1.686	2.252	2.815	3.378

MAGNESIUM

(f.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250–3.00	.250–2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	82	99
Strip, CR	102	92	125
Rod, Bar, HR	87	74	93
Angles, HR	87	74	93
Plate, HR	97	87	95
Seamless tube	122	110	153
Shot, blocks	...	71	...

COPPER, BRASS, BRONZE

(Freight included on 500 lbs)

	Sheet	Wire	Rod	Tube
Copper	61.63	.....	.....	61.83
Brass, 70/30	52.10	52.64	.....	55.01
Brass, Low	55.55	56.39	55.75	58.66
Brass, R L	57.19	57.73	57.13	60.00
Brass, Naval	55.72	.....	50.03	58.88
Munts Metal	53.84	47.55	49.65	.....
Comm. Bs.	59.06	59.62	59.02	61.64
Mang. Bs.	59.46	.....	53.56	.....
Phos. Bs. 5%	79.58	.....	80.08	.....

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $12.10-$12.60; alloy, $15.00-$15.75; Plate, HR, commercially pure, $10.00-$10.50; alloy, $11.50-$12.00. Wire, rolled and/or drawn, commercially pure, $9.00-$11.50; alloy, $11.50; Bar, HR or forged, commercially pure, $7.55-$7.80; alloy, $7.55-$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 98+%, 10,000 lb. freight alloyed 27.10
Aluminum pig 25.00
Antimony, American, Laredo, Tex. 33.50
Beryllium copper, per lb conta'd Be $43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be $74.75
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Cobalt, 97-99% (per lb) ... $2.60 to $2.67
Copper, electro, Conn. Valley 40.00
Copper, Lake, delivered 40.00
Gold, U. S. Treas., per troy oz. ... $35.00
Indium, 99.9% dollars per troy oz. $ 2.25
Iridium, dollars per troy oz. ... $90 to $100
Lead, St. Louis 15.80
Lead, New York 16.00
Magnesium, 99.8+%, f.o.b. Velasco, Tex., 10,000 lb, pig 35.25
ingot 36.00
Magnesium, sticks, 100 to 500 lb. ... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel electro 64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 60.75
Palladium, dollars per troy oz. .. $23 to $24
Platinum, dollars per troy oz. .. $103 to $105
Silver, New York, cents per troy oz. 90.75
Tin, New York 98.75*
Titanium sponge, grade A-1, $2.70 to $3.00
Zinc, East St. Louis 13.50
Zinc, New York 14.00
Zirconium sponge $10.00
*Tentative.

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 37.75
No. 120 ..... 36.50
No. 123 ..... 35.00
80-10-10 ingot
No. 305 ..... 41.00
No. 315 ..... 39.25
88-10-2 ingot
No. 210 ..... 52.75
No. 215 ..... 48.50
No. 245 ..... 43.50
Yellow ingot
No. 405 ..... 29.75
Manganese bronze
No. 421 ..... 33.00

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 28.25-29.00
0.60 copper max. 28.00-28.75
Piston alloys (No. 122 type) .. 27.75-28.75
No. 12 alum. (No. 2 grade) 27.00-28.00
108 alloy 27.00-28.00
195 alloy 27.50-29.00
13 alloy (0.60 copper max.) ... 28.00-28.75
AXS-679 ..... 27.00-28.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 27.00-28.00
Grade 2—92-95% 26.00-27.00
Grade 3—90-92% 25.00-26.00
Grade 4—85-90% 24.00-25.00

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	36	35¼
Yellow brass	27¼	26¼
Red brass	31⅞	31⅛
Comm. bronze	33¼	32⅝
Mang. bronze	25¼	24½
Yellow brass rod ends	27	....

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 34
No. 2 copper wire 32½
Light copper 30
*Refinery brass 30½
* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 34
No. 2 copper wire 32½
Light copper 30
No. 1 composition 30¼
No. 1 comp. turnings 29⅝
Hvy. yellow brass solids 20⅜
Brass pipe 21½
Radiators 23½

Aluminum

Mixed old cast. ..... 19 —20
Mixed new clips ..... 19½—20½
Mixed turnings, dry ..... 19 —20

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 32 —32½
No. 2 copper wire ..... 29½—30
Light copper ..... 27 —27½
Auto radiators (unsweated) .. 19 —19½
No. 1 composition ..... 25½—26
No. 1 composition turnings ... 24½—25
Unlined red car boxes ..... 20 —21½
Cocks and faucets ..... 19½—20
Clean heavy yellow brass .... 17 —17½
Brass pipe ..... 21½—22
New soft brass clippings ..... 23 —23½
No. 1 brass rod turnings ..... 20½—21

Aluminum

Alum. pistons and struts .... 8 — 8½
Aluminum crankcases ..... 13 —13½
1100 (2S) aluminum clippings 16 —16½
Old sheet and utensils ..... 13 —13½
Borings and turnings ..... 9 — 9½
Industrial castings ..... 13 —13½
2024 (24S) clippings ..... 16 —16½

Zinc

New zinc clippings ..... 7½— 8
Old zinc ..... 4½— 5
Zinc routings ..... 2¾— 3
Old die cast scrap ..... 2½— 2¾

Nickel and Monel

Pure nickel clippings ..... $1.65-$1.90
Clean nickel turnings $1.50
Nickel anodes ..... $1.65-$1.90
Nickel rod ends ..... $1.65-$1.90
New Monel clippings 75-85
Clean Monel turnings 60-70
Old sheet Monel 65-75
Nickel silver clippings, mixed 21
Nickel silver turnings, mixed 18

Lead

Soft scrap lead ..... 12½—13
Battery plates (dry) ..... 7 — 7¼
Batteries, acid free 4½

Miscellaneous

Block tin ..... 80 —81
No. 1 pewter ..... 62½—63
Auto babbitt ..... 42 —42½
Mixed common babbitt ..... 13 —13½
Solder joints ..... 18 —18½
Siphon tops 42
Small foundry type ..... 15¼—15½
Monotype ..... 14½—15
Lino. and stereotype ..... 13 —13½
Electrotype ..... 12½—12¾
Hand picked type shells ..... 10 —10½
Lino. and stereo. dross ..... 5¼— 5¾
Electro. dross ..... 4¼— 4½

STEEL PRICES

(Effective Aug. 21, 1956)

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		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*		6.95 *B3*			
	Claymont, Del.													
	Harrison, N. J.													14.55 *C11*
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.													
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.													
	New Haven, Conn.									7.30 *A5*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*											
	Pawtucket, R. I. Worcester, Mass.									7.40 *A5*				
MIDDLE WEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.													
	Canton-Massillon, Dover, Ohio		$91.50 *R3*	$107.00 *R3*										
	Chicago, Ill.	$74.00 *U1*	$91.50 *U1, R3,W8*	$107.00 *U1, R3,W8*	5.90 *U1*	5.00 *U1, W8*	7.35 *U1, Y1* 6.00 *W8*	5.00 *U1*	5.525 *N4* 4.675 *A1*	6.95 *A1*			7.75 *W8*	14.55 *A1*
	Cleveland, Ohio									6.85 *A5, J3*			7.75 *J3*	
	Detroit, Mich.								4.775 *G3, M2*	6.95 *M2* 6.95 *G3*	7.05 *G3*	10.10 *G3, S1*	7.05 *G3*	
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1, I3*	5.00 *I3*	4.675 *U1, I3, Y1*	6.85 *Y1*	6.95 *U1, I3, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.								4.775 *N4*					
	Indianapolis, Ind.									7.00 *C5*				
	Newport, Ky.													
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1 C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1, J3*	$91.50 *U1, J3*	$107.00 *U1*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3,B4, S7*				
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio		$91.50 *Y1*	$107.00 *Y1*		5.00 *Y1*	7.35 *Y1*		4.675 *U1, Y1*	6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.70 *K1*	8.05 *K1*	5.85 *K1*	5.475 *K1*	8.00 *K1*	9.725 *K1*			
	Geneva, Utah	$91.50 *C7*				5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*		6.375 *S2*	
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B2*		5.425 *B2, C7*				8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.													
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7,B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.								4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.00 *T2,R3* 5.30 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C16*		6.95 *T2*			
	Houston, Lone Star, Texas		$96.50 *S2*	$112.00 *S2*			7.45 *S2*				7.20 *S2*			

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		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Hollowware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.575 *U1*				$9.70 *U1*	$8.40 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*			
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.													
	Canton-Massillon, Dover, Ohio			6.30 *R3*	6.325 *R3*									
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5, R3, N4, W8*			
	Sterling, Ill.										5.90 *N4*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*				6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3*, MI	5.85 *G3* 5.75 *M2*				7.00 *G2*	8.625 *G3*						
	Newport, Ky.													
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3, Y1*	5.75 *U1, I3, Y1*	6.30 *U1, I3*	6.325 *U1, I3, Y1*	6.70 *U1*	6.90 *U1, Y1, I3*	8.525 *U1, Y1*			5.80 *Y1*	$9.60 *U1, I3, Y1*	$8.30 *I3, U1, Y1*	7.15 *U1, Y1*
	Granite City, Ill.	4.875 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								8.40 *G2*	7.25
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio													
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3, N5*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*						
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3*	5.75 *U1, J3*	6.30 *U1, A7, J3*	6.325 *U1, A7*		6.90 *U1, J3, R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6, J3*	$9.60 *J3, U1*	$8.30 *U1*	7.15 *U1*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W3, W5*	5.75 *W3, W5, F3*	6.30 *W3, W5*		6.70 *W3, W5*	6.90 *W3*	8.525 *W3*				9.60 *W5*	8.30 *W5*	7.15 *W5* 7.40 *W3*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.80 *Y1*			7.15 *Y1*
WEST	Fontana, Cal.	5.475 *K1*	6.95 *K1*				7.70 *K1*	9.725 *K1*				$10.35 *K1*	$9.05 *K1*	$7.75 *K1*
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Torrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.45 *C7*			
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	5.75 *T2*	6.30 *T2, R3*						5.80 *R3*	5.80 *T2*			
	Houston, Tex.										6.05 *S2*			

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		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B5*	6.125 *B3,R3*	8.325 *B5*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.											
	Coatesville, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Conshohocken, Pa.							4.90 *A2*	5.925 *A2*	6.25 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *C3*			
	Hartford, Conn.			7.35 *R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.											
	Camden, N. J.			7.30 *P10*		6.50 *P10*						
	Bridgeport, Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8*	6.20 *N8*	8.475 *N8*						
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.225 *M7*	5.225 *M7*	7.40 *B5* 7.40 *B5*		8.325 *A5* 8.625 *B5*						7.50 *A5,W6*
	Spring City, Pa.			7.30 *K2*		8.50 *K2*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky.											
	Canton-Massillon, Mansfield, Ohio			6.85 *R3*	6.125 *R3*	8.325 *R3*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8* 5.425 *N4* 5.575 *P13*	5.075 *U1,R3, N4*	6.85 *A5,B5, W10,L2, W8, L2, N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9*	5.875 *W8*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5, R3,N4,W8*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5*	6.12	8.325 *A5*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5* 7.10 *P3*	6.225 *G3*	8.525 *B5,P3*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth, Minn.											
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M4*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											
	Sterling, Ill.	5.525 *N4*	5.175 *N4*									7.30 *C9*
	Niles, Warren, Ohio Sharon, Pa.	5.075 *R3*		6.85 *C10*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, C11,J3,R3, S9,B4*	6.125 *U1*	8.325 *A5,R3, S9,C8*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											
	Weirton, Wheeling, Follansbee, W. Va.							4.85 *W5*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1*	7.20 *Y1*
WEST	Emeryville, Cal.											
	Fontana, Cal.	5.775 *K1*	5.575 *K1*		7.175 *K1*		8.125 *K1*	6.00 *K1*		8.00 *K1*	8.40 *K1*	
	Geneva, Utah	5.175 *C7*						4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		5.325 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3*	7.175 *B2*		8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.											
	San Francisco, Niles, Pittsburg, Cal.	5.775 *C7* 5.825 *B2*	5.775 *C7* 5.825 *B2*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.		5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.575 *A8*										7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2, R3* 5.375 *C16*	5.075 *T2, R3* 5.375 *C16*				7.425 *T2*	4.85 *T2, R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*	4.95 *S2*		6.95 *S2*		7.45 *S2*

Steel Prices *(Effective Aug. 21, 1956)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill
D5 Henry Disston Div., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Youngstown *R3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Fontana *K1*		+15.25	3.00	+11.25	5.50	+7.75	8.00	+7.00	8.50	+6.00	9.00	+5.50	10.50	+5.75								
Pittsburgh *J3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Alton, Ill. *L1*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Sharon *M3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Fairless *N2*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Pittsburgh *N1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Wheeling *W5*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Wheatland *W4*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Youngstown *Y1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Indiana Harbor *Y1*	11.50	+5.75	14.50	1.25	17.00	3.75	19.50	4.50	20.00	5.50	20.50	6.00	22.00	5.75								
Lorain *N2*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Youngstown *R3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Fairless *N2*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Fontana *K1*	4.50		8.50		10.50		11.00		11.50		12.00		12.50									
Pittsburgh *J3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Alton, Ill. *L1*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Sharon *M3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Pittsburgh *N1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Wheeling *W5*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Wheatland *W4*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Youngstown *Y1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Indiana Harbor *Y1*	16.00	2.25	20.00	6.25	22.00	9.75	22.50	8.50	23.00	9.50	23.50	10.00	22.00	8.75								
Lorain *N2*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½" and 3" pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.845	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	3	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium	.83 D-3, D-5
Oil hardened manganese	.45 O-2
Special carbon	.41 W-1
Extra carbon	.345 W-1
Regular carbon	.29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	Plate (*A3, J2, L4*) 15 pct	Plate (*A3, J2, L4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	304	34.60	38.00	41.50	.....
	316	39.70	43.20	46.65	.....
	321	36.35	39.80	43.50	.....
	347	39.50	43.95	48.45	.....
	405	29.20	33.15	37.05	.....
	410, 430	28.70	32.65	36.55	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 41.40; 1 side, 33.60.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	9.00	9.20	.....
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Meter	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60	Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

LAKE SUPERIOR ORES

$1.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.95
Old range, nonbessemer	11.10
Mesabi, bessemer	11.00
Mesabi, nonbessemer	10.85
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Cal	Woven Wire Fence 9–15½ ga. Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	167	181	...	195	187	8.10	8.50
Aliquippa, Pa. *J3*	167	184	...	...	184	8.10	8.65
Atlanta *A8*	169	187	...	197	193	8.20	8.80
Bartonsville *K2**	169	187	...	197	193	8.20	8.80
Buffalo *W6*	...	...	...	...	...	8.10	8.50
Chicago, Ill. *N4***	167	185	...	195	191	8.10	8.70
Cleveland *A6*	173	...	...	...	...	8.10	.....
Cleveland *A5*	...	...	...	...	...	8.10	.....
Crawfordsville *M4**	169	187	...	197	193	8.20	8.80
Donora, Pa. *A5*	167	181	...	195	187	8.10	8.50
Duluth *A5*	167	181	...	195	187	8.10	8.50
Fairfield, Ala. *T2*	167	181	...	175	187	8.10	.....
Galveston *D4*	169	...	...	...	...	...	8.35
Houston *S2*	172	186	...	192	192	8.35	8.75
Johnstown, Pa. *B3**	167	185	167	167	191	8.10	8.70
Joliet, Ill. *A5*	167	181	...	195	189	8.10	.....
Kokomo, Ind. *C9*	169	183	...	197	189	8.20	8.60
Los Angeles *B2**	...	...	...	...	...	9.05	9.65
Kansas City *S2*	172	186	...	200	192	8.35	8.75
Minnequa *C6*	172	186*	172	200	192*	...	.....
Monessen *P6*	167	185	...	...	191	8.10	8.10
Moline, Ill. *R3*	...	162	162	...	...	...	.....
Pittsburg, Cal. *C7*	186	204	...	...	207	9.05	9.45
Portsmouth *P7*	...	...	...	...	...	...	.....
Rankin, Pa. *A5*	167	181	...	...	187	8.10	8.50
So. Chicago *R3*	167	181	...	195	187	8.10	8.50
S. San Francisco *C6*	...	...	...	219	...	9.05	9.45
Sparrows Pt. *B3**	154	...	...	197	193	8.20	8.80
Struthers, O. *Y1*	...	...	...	...	...	8.10	8.60
Worcester *A5*	173	...	...	...	...	8.40	8.80
Williamsport, Pa. *S5*	...	...	175	...	...	...	.....

Galvanized products computed with zinc at 5¢ per lb. Exceptions: * zinc at 12.5¢ per lb; ** 13¢ zinc.

‡—Wholesalers only.

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery ‡ Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As Rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As Rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Baltimore	$.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Birmingham	.15	7.68	8.88	8.85	7.78	.....	8.01	8.05	7.91	10.04	.....	.....	.....	.....
Boston	.10	8.70–8.80	9.73–9.83	10.82–11.02	8.79–8.89	.....	8.98–9.08	8.90–9.00	8.88–8.98	10.71–10.81	.....	14.56	.....	18.21
Buffalo	.15	7.90	9.05	10.87	8.15	.....	8.40	8.40	8.15	8.85	.....	14.45	.....	.....
Chicago	.15	7.70–7.85	8.88–9.05	9.85	7.78–7.93	.....	8.01–8.16	8.05–8.20	7.91–8.06	8.35–8.50	.....	14.10	.....	17.75
Cincinnati	.15	7.97	9.04	9.85	8.21	.....	8.49	8.70	8.34	8.97	.....	14.38	.....	18.03
Cleveland	.15	7.83	9.03	9.75	8.03	.....	8.36	8.53	8.14	8.75	14.73	14.18	18.13	17.83
Denver	.....	9.55	11.09	12.41	9.70	.....	9.80	9.60	9.75	10.54	.....	.....	.....	19.79
Detroit	.15	8.06	9.28	10.17	8.25	.....	8.48	8.70	8.33	8.83	.....	14.04	.....	17.89
Houston	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas City	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	.10	9.00	10.75	11.75	9.20	.....	9.45	9.65	8.90	11.80	.....	15.35	.....	19.45
Memphis	.15	8.02	9.22	.....	8.12	.....	8.35	8.39	8.25	9.85	.....	.....	.....	.....
Milwaukee	.15	7.97	9.17	9.97	8.05	.....	8.28	8.39	8.18	8.72	.....	14.22	.....	17.87
New Orleans	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York	.10	8.45	9.63	10.33	8.91	.....	8.88	8.84	8.93	10.71	.....	14.47	.....	18.12
Norfolk	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia	.10	7.89–7.99	9.08–9.18	9.66–10.22	8.58–8.68	.....	8.28–8.38	8.38–8.48	8.37–8.47	9.12–9.22	.....	14.15–14.25	.....	17.90
Pittsburgh	.15	7.83	9.03	10.05	8.03**	.....	8.16	8.20	8.06	8.75	14.65	13.80–14.10	18.05	16.85–17.75
Portland	.....	9.90	11.00†	11.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salt Lake City	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco	.10	8.85	10.40	10.90	9.05	.....	8.95	8.95	8.90	12.40	.....	15.35	.....	19.45
Seattle	.00	9.35	11.20	11.55	9.50	.....	9.05	9.15	9.30	13.15	.....	15.55	.....	19.20
St. Louis	.15	8.17	9.36	10.18	8.26	.....	8.49	8.63	8.40	9.08	.....	14.43	.....	18.12
St. Paul	.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

** F.O.B. Plant, warehouse price. † 16 gage. ‡ Deduct for country delivery.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bristol, Conn. *W12*	.....	.....	.....	.....	.....
Buffalo, N. Y. *R7*	7.95	9.80	12.60	15.00	17.95
Carnegie, Pa. *S9*	.....	9.80	12.60	15.00	17.95
Cleveland *A5*	7.70	9.80	12.60	15.00	17.95
Detroit *D1*	.....	.....	.....	.....	.....
Detroit *D2*	.....	.....	.....	.....	.....
Harrison, N. J. *C11*	.....	.....	.....	.....	.....
Indianapolis *C5*	.....	.....	.....	.....	.....
New Castle, Pa. *B4*	7.95	9.80	12.60	15.00	.....
New Haven, Conn. *D1*	.....	.....	.....	.....	.....
Pawtucket, R. I. *N7*	.....	.....	.....	.....	.....
Pittsburgh *S7*	7.95	9.80	12.60	15.00	17.95
Riverdale, Ill. *A1*	8.05	9.80	12.60	15.00	17.95
Sharon, Pa. *S1*	8.05	9.90	12.70	.....	.....
Trenton *R4*	.....	.....	.....	.....	.....
Wallingford *W1*	.....	.....	.....	.....	.....
Warren, Ohio *T4*	.....	.....	.....	.....	.....
Weirton, W. Va. *W3*	7.95	9.80	12.60	15.00	17.95
Worcester, Mass. *A5*	8.25	10.10	12.90	15.30	18.25
Youngstown *C5*	.....	.....	.....	.....	.....

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	34.88	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
National Tube	2	13	34.88	40.85	31.13	.....
	2½	12	46.98	55.01	41.91	.....
	3	12	54.24	63.53	48.39	.....
	3½	11	63.32	74.16	56.50	.....
	4	10	84.09	98.47	75.04	.....
Pittsburgh Steel	2	13	34.88	40.85	.....	.....
	2½	12	46.98	55.01	.....	.....
	3	12	54.24	63.53	.....	.....
	3½	11	63.32	74.16	.....	.....
	4	10	84.09	98.47	.....	.....

(Effective Aug. 21, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.075	6.00	6.35				
So. Chicago *R3*				6.775			
Ensley *T2*	5.075	6.00					
Fairfield *T2*		6.00		6.775		6.025	
Gary *U1*	5.075	6.00				6.025	
Ind. Harbor *I3*	5.075		6.35	6.775		6.025	
Ind. Harbor *Y1*				6.775			
Johnstown *B3*		6.00					
Joliet *U1*	5.075		6.35				
Kansas City *S2*				6.775			
Lackawanna *B3*	5.075	6.00	6.35			6.025	
Lebanon *B3*							13.10
Minnequa *C6*	5.075	6.50	6.35	6.775		6.025	13.10
Pittsburgh *P5*				6.775	12.85		
Pittsburgh *J3*				6.775			13.10
Seattle *B2*				9.275		6.35	16.60
Steelton *B3*	5.075		6.35			6.175	13.60
Struthers *Y1*				6.775			
Torrance *C7*							
Williamsport *S5*		6.15					
Youngstown *R3*				6.775			

COKE

Furnace, beehive (f.o.b. oven) Net-Ton
Connellsville, Pa. ..... $14.50 to $14.75
Foundry, beehive (f.o.b. oven)
$17.00 to $18.00
Foundry, oven coke
Buffalo, del'd $30.75
Detroit, f.o.b. 29.50
New England, del'd 28.55
Seaboard, N. J., f.o.b. 26.75
Philadelphia, f.o.b. 26.50
Swedesland, Pa., f.o.b. 26.50
Painesville, Ohio, f.o.b. 27.50
Erie, Pa., f.o.b. 27.50
Cleveland, del'd 29.43
Cincinnati, del'd 28.55
St. Paul, f.o.b. 28.50
St. Louis, f.o.b. 30.50
Birmingham, f.o.b. 27.60
Lone Star, Tex., f.o.b. 19.50
Milwaukee, f.o.b. 29.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	23.00	40	100,110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.75	17	72	10.35
7	60	24.50	14	72	10.85
5	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
Cast elliptical, 18 in. or longer, 5000 lb lots 62.92
Electrodeposited 50.25
Brass, 80-20, ball anodes, 2000 lb or more 60.00
Zinc, ball anodes, 2000 lb lots 21.25
(for elliptical add 2¢ per lb)
Nickel, 99 pct plus, rolled carbon ... 90.50
(rolled depolarized add 2¢ per lb)
Cadmium $1.70
Tin, ball anodes and elliptical $1.06 to $1.10

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum 80.50
Copper sulphate, 5 or more 100 lb bags, per cwt. 27.15
Nickel salts, single, 4-100 lb bags.. 38.25
Nickel chloride, freight allowed, 200 lb 46.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums 22.35
(Philadelphia price 22.60)
Zinc cyanide, 100 to 900 lb..... 55.55
Potassium cyanide, 100 lb drum N. Y. 48.00
Chromic acid, flake type, 1 to 20 100 lb drums 29.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts Full case	Full case 20,000 lb Quantity or more
½ in. & smaller x 6 in. & shorter	61	63
Larger than ½ in. diam. and all diam. longer than 6 in.	55	57
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	61	63
Lag, all diam. x 6 in. & shorter	61	63
Lag, all diam. longer than 6 in.	55	57
Plow bolts	61	63

Nuts, Hex, HP, reg. & hvy.

¾" or smaller.....	64	66
⅞" to 1¼" inclusive.....	63	65
1⅜" to 1½" inclusive.....	65	67
1⅝" and larger.....	61	63

C.P. Hex, regular & hvy.

¾" or smaller.....	64	66
⅞" and larger.....	61	63

Hot Galv. Nuts (all types)

1½" or smaller.....	44	47

Finished, Semi-finished, Hex Nuts

⅝" and smaller.....	66	66
⅞" and airger	63	63

Add 25% for less than case or keg quantity.

Rivets

Base per 100 lb
½ in. and larger $10.85
Pct Off List
7/16 in. and smaller 26½

Cap Screws

	Discount H.C. Heat Bright Treated	
New std. hex head, packaged		
¼" thru ½" diam. x 6" and shorter	34	20
9/16" and ⅝" x 6" and smaller and shorter...	31	16
¾", ⅞", 1" x 6" and shorter	9	+11
¼" thru ½" diam. x 6" and shorter	49	41
9/16" and ⅝" diam. x 6" and shorter	43	39
¾", ⅞", 1" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

Quantity		Discount Mach. Screws	Stove Bolts
Packaged, package list....		27	35
Bulk, bulk list			
¼-in. diam. & under	25,000-200,000	20	61
5/16-in. diam. & larger	15,000-100,000	20	61
All diam. over 3 in. long	5,000-100,000	—	61

Machine Screw & Stove Bolt Nuts

Quantity		Discount Hex	Square
Packaged, package list....		24	27
Bulk, bulk list			
¾-in. diam. & smaller	25,000-200,000	18	30

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.4
Chicago	133.4
San Francisco-L. A.	140.2

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) $128.00
No. 1 Ohio 128.00
Sec. quality, Pa., Md., Ky., Mo., Ill., 114.00
No. 2 Ohio 98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00) 20.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $140.00
Childs, Hays, Pa. 145.00
Chicago District 150.00
Western Utah 144.00-165.00
California 170.00
Super Duty
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 150.00-157.00
Silica cement, net ton, bulk, Latrobe 26.50
Silica cement, net ton, bulk, Chicago 24.00
Silica cement, net tons, bulk, Ensley, Ala. 25.50
Silica cement, net ton, bulk, Mt. Union 23.00
Silica cement, net ton, bulk, Utah and Calif. 35.00

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.. $98.00
Standards chemically bonded, Curtiner, Calif. 108.00
Burned, Balt. 92.00

Magnesite Brick

Standard Baltimore $121.00
Chemically bonded, Baltimore 109.00

Grain Magnesite St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk. $69.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 43.00
in sacks 49.00

Dead Burned Dolomite *Per net ton*

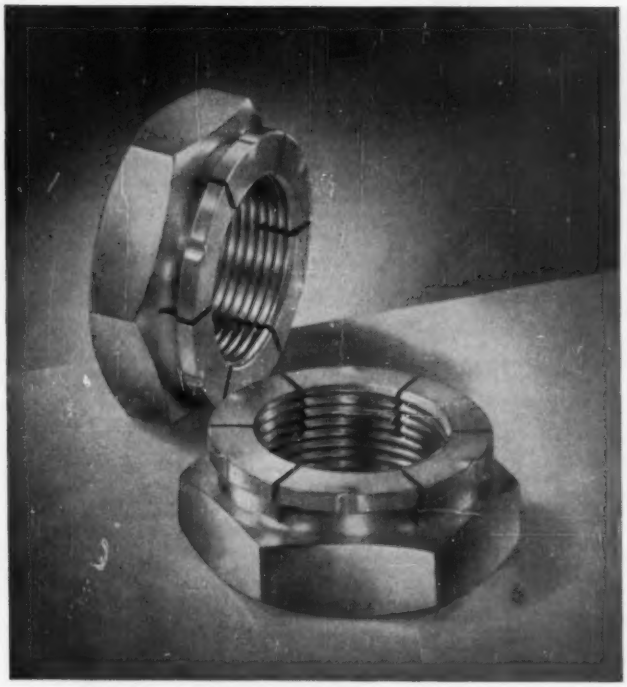
F.o.b. bulk, producing points in:
Pa., W. Va., Ohio..... $15.00
Midwest 15.60
Missouri Valley 14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags 8.50¢
Canadian sponge iron, Del'd in East, carloads.... 9.5¢
Domestic sponge iron, 98+% Fe, carload lots ..... 8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe..... 27.5¢
domestic 99.5+% Fe..... 36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe 57.0¢
Electrolytic iron melting stock, 99.84% pure..... 22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 00.8+% Fe..86.0¢ to $1.55
Aluminum freight allowed.. 38.00¢
Brass, 10 ton lots.....37.50¢ to 50.00¢
Copper, electrolytic ..... 59.50¢
Copper, reduced ..... 59.50¢
Cadmium, 100-199 lb, 95¢ plus metal value
Chromium, electrolytic 99.85% min. Fe .03 max. Del'd... $5.00
Lead .....8.90¢ plus metal value
Manganese ..... 70.0¢
Molybdenum, 99% .....$3.00 to $3.25
Nickel, unannealed $1.00
Nickel, annealed $1.06
Nickel, spherical, unannealed ±80 ..... $1.13
Silicon ..... 43.50¢
Solder powder..7.0¢ to 9.0¢ plus met. value
Stainless steel, 302..... 99.0¢
Stainless steel, 316..... $1.32
Tin .....14.00¢ plus metal value
Tungsten, 99% (65 mesh) $4.50
Zinc, 10 ton lots .....18.75¢ to 32.50¢

Flexloc thin nuts save space, weight and production time



Self-locking nuts are 30% lower and lighter; speed up assembly with hand or power tools

Self-locking FLEXLOC thin nuts are 30% lower than regular height locknuts of the same nominal diameter. They fit into spaces where regular height locknuts will not go. You can design lighter, more compact units with them.

Where you must reduce weight in a completed assembly, you can save by using shorter bolts with these lighter nuts. And you save production time. The length of engagement of mating threads is shorter: fewer revolutions of hand wrenches or power nut runners are needed to seat them.

FLEXLOC nuts are of 1-piece, all-metal construction. You can use a FLEXLOC fully seated as a locknut or at any point along a bolt as a stop nut. Once the threads in the resilient locking section are fully engaged, the FLEXLOC grips the mating threads with uniform locking torque wherever wrenching stops. Since there are no nonmetallic inserts to come out or deteriorate, the locking life of a FLEXLOC is virtually unlimited.

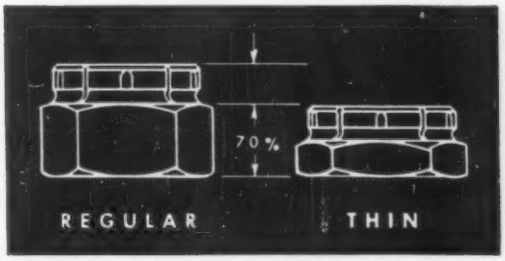
Your authorized industrial distributor stocks FLEXLOC nuts in a variety of sizes, materials and finishes. Consult him for details. Or write us for information about your special locknut problem. Flexloc Locknut Division, STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

SPECIFICATIONS
FLEXLOC THIN NUTS

NATIONAL COARSE THREAD—U.S.S

SIZE	A INCHES	H INCHES	WIDTH ACROSS CORNERS	WEIGHT PER 1000 NUTS
6-32	.312	.125	.361	1.8
8-32	.344	.172	.397	2.8
10-24	.375	.172	.433	3.3
¼-20	.438	.203	.505	5.4
5/16-18	.563	.250	.649	11.6
⅜-16	.625	.265	.722	14.9
7/16-14	.750	.312	.866	24.9
½-13	.813	.312	.938	28.4
9/16-12	.875	.359	1.010	36.1
⅝-11	1.000	.391	1.155	54.1
¾-10	1.125	.406	1.299	69.2
⅞-9	1.312	.469	1.516	107.5
1-8	1.500	.563	1.732	171.6
NATIONAL FINE THREAD—S.A.E.				
6-40	.312	.125	.361	1.8
8-36	.344	.172	.397	2.8
10-32	.375	.172	.433	3.3
¼-28	.438	.203	.505	5.4
5/16-24	.500	.250	.577	8.7
⅜-24	.563	.266	.649	11.5
7/16-20	.625	.312	.722	14.9
½-20	.750	.312	.866	21.7
9/16-18	.875	.359	1.010	36.2
⅝-18	.938	.391	1.082	42.4
¾-16	1.063	.406	1.227	54.5
⅞-14	1.250	.469	1.443	84.6
1-14	1.438	.563	1.660	136.3
1 1/16-12*	1.625	.625	1.876	193.5
1 ¼-12*	1.813	.750	2.093	296.0
1 3/16-12*	2.000	.812	2.309	389.0
1 ½-12*	2.187	.875	2.526	498.0

*Steel only (plain or cadmium plated) in stock sizes.



FLEXLOC thin nuts are 30% lower than regular height locknuts. There is a corresponding saving in weight. In sizes through 5/16 in., thin FLEXLOCs meet tensile strength requirements for regular height locknuts. FLEXLOC nuts can be made in the thin type because every thread, even those in the locking section, carries its full share of the load. There are no nonmetallic inserts to waste head space or weaken the structure of the nut.

Standard FLEXLOC self-locking thin nuts are available in plain or cadmium plated alloy steel, for use in temperatures to 550°F; in plain or silver plated corrosion resisting steel, for temperatures to 750°F; and in brass and aluminum, for temperatures to 250°F.

STANDARD PRESSED STEEL CO.
FLEXLOC LOCKNUT DIVISION SPS
JENKINTOWN PENNSYLVANIA

Ferroalloy Prices

(Effective Aug. 21, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk carloads, del'd, 67-71% Cr, .30-1.00% max. Si.

0.02% C	39.25	0.20% C	36.25
0.03% C	38.75	0.50% C	36.00
0.06% C	37.25	1.00% C	35.25
0.10% C	36.75	1.50% C	35.10
0.15% C	36.50	2.00% C	35.00

4.00-4.50% C, 67.70% Cr, 1-2% Si.. 26.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 25.00
0.025% C (Simplex) 32.50
0.10% C, 50-52% Cr, 2% max Si.... 33.75
6.50% max. C, 60-65% Cr, 3-6% Si.. 22.50
8.50% C, 50-55% Cr, 3% max Si.... 22.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.27
0.50% max. C	1.27
9 to 11% C, 88-91% Cr, 0.75% Fe..	1.36

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅛" thick) delivered packed. 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	1.25
Ton lots	1.27
Less ton lots	1.29

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	41.85
Ton lots	46.15
Less ton lots	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	23.00
Ton lots	26.75
Less ton lots	28.25

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	19.65
Less ton lots	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.75
Johnstown, Pa.	10.75
Sheridan, Pa.	10.75
Philo, Ohio	10.75
S. Duquesne	10.75

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.00
Ton lots packed	15.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$94.00
19 to 21%	3% max.	96.00
21 to 23%	3% max.	98.50

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	31.5
Ton lots	33.5
250 to 1999 lb	35.5
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 22.85

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	34.00	36.55	37.75
0.07% max. C	31.95	34.50	35.70
0.10% max. C	31.20	33.75	34.95
0.15% max. C	30.45	33.00	34.20
0.30% max. C	28.95	31.50	32.70
0.50% max. C	28.45	31.00	32.20
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	25.45	28.00	29.20

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carload bulk	12.00
Ton lots	13.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	13.55
Ton lots, packed	15.75

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe	22.75	21.45
98% Si, 1% Fe	23.25	20.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si. briquets.

Carloads, bulk	7.15
Ton lots, packed	9.75

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bluk, carloads, f.o.b. shipping point.

50% Si	12.75	75% Si	15.40
65% Si	14.50	85% Si	17.10
	90% Si	18.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.10
Crucible	3.20
High speed steel (Primos)	3.30

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.50¢

Calcium molybdate, 43.6-46.6%

f.o.b Langeloth, Pa., per pound Contained Mo. $1.28

Ferrocolumbium, 50-60%, 2 in. x D

contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.65

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.54

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.15

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $200.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, delivered $3.45

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.32
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.30

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	17.50¢
Ton lots, packed lump	19.50¢
Less ton lots	20.00¢

Vanadium oxide, 86-89% V_2O_5

contract basis, per pound contained V_2O_5 ..... $1.33

Zirconium contract basis, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	26.25¢
12-15%, del'd lump, bulk-carloads	8.50¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3.14%, Si 40-45%, per lb contained 2 .... $5.31

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed

Ton lots per pound ..... 14.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots 1.30
F.o.b. Wash., Pa.; Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese - Boron, 75.00% Mn., 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots $2.05

more and more manufacturers are saying: "Let's use

GRIFFIN®
COLD ROLLED STRIP STEEL"

Made to your specifications in all thicknesses from .012 to .375 inches and widths from ½" to 19" depending upon gauge.

NARROW ROLLED ROUND EDGE STRIP STEEL *In stock at*
CENTRAL STEEL & WIRE CO.
Detroit, Chicago, Cincinnati
Wm. H. LEONORI & CO., Inc.
New York City

GRIFFIN
"since 1899"
MANUFACTURING CO. ERIE, PA.

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

New* ARMSTRONG *Adjustable Step Block

ARMSTRONG Adjustable Step Blocks provide safe, rigid, easily adjustable support for setting-up work. Eliminate haphazard set-ups, save time and labor.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 W. Armstrong Ave., Chicago 30, U.S.A.

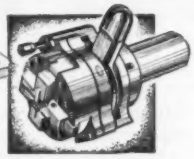
Write for Catalog showing complete System of Armstrong Set-Up and Hold-Down Tools.

To Lower your Overhead..

BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 21-41 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Behringer, Inc.*, 334 N. San Pedro St., Los Angeles, California. Canada: *F. F. Barber Machinery Co., Toronto, Canada*

Cutting Off Machines for Sawing All Kinds of Metals

THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE. PHILADELPHIA, PENNA.

Zinc
STRIP, COILED
WIRE, COILED
ACCURATELY ROLLED FOR ELECTRIC FUSE ELEMENTS
EYELETS—BRASS, STEEL AND ZINC
THE PLATT BROS. & CO., WATERBURY, CONN.

Check and Compare!

NO OTHER LINE OF BARREL FINISHING EQUIPMENT OFFERS SO MANY EXTRA FEATURES

Take a minute . . . check SPEED-D-BURR *extra* features against your present finishing equipment—or compare with equipment you plan to install. No question about it . . . the total equals *more* dollar value when you buy—SPEED-D-BURR!!

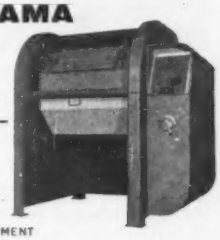
36" x 32" BARREL UNIT

STANDARD EQUIPMENT	SPEED-D-BURR				
BARREL CAPACITY (Nearest comparable unit)	16.8	13.0	13.0	14.3 (Actual)	13.0
BARRELS (Rubber or Neoprene Lined)	Yes	Yes	Yes	Yes	Yes
HINGED BARREL DOOR (Speeds open and close time 90%)	Yes	No	No	No	No
SNUBBING ACTION CAM LOCKS (Opened without tools)	Yes	Yes	Yes	Yes	No
MODERN, STREAMLINED CABINET	Yes	Yes	Yes	No	No
CABINET PANELS Extra heavy gauge steel-integral part of supporting member (not light sheet metal wrapper)	Yes	No	No	No	No
COLOR ENGINEERED CABINET (For safe and fatigueless operation)	Yes	No	No	No	No
MOTOR SIDEMOUNTED AND COVERED FOR PROTECTION	Yes	No	Yes	No	No
VARI-SPEED MOTOR	Yes	No	No	No	No
LOW VOLTAGE CONTROLS RECESSED AND SIDE MOUNTED FOR SAFETY	Yes	Yes	Yes	No	No
PRESET STOP AND START TIMER	Yes	No	No	No	No
DIRECT READING TACHOMETER	Yes	No	Yes	No	No
POSITIVE STATIC BRAKE	Yes	No	No	No	No

TOTAL—*More dollar value with* SPEED-D-BURR!

SPEED-D-BURR CORPORATION
PRECISION BARREL FINISHING
DESIGNERS • ENGINEERS • MANUFACTURERS
MT-52
THE WORLD'S MOST COMPLETE LINE OF PRECISION BARREL FINISHING EQUIPMENT & SUPPLIES

THE **FUTURAMA** SERIES
Custom Styled for MODERN INDUSTRY



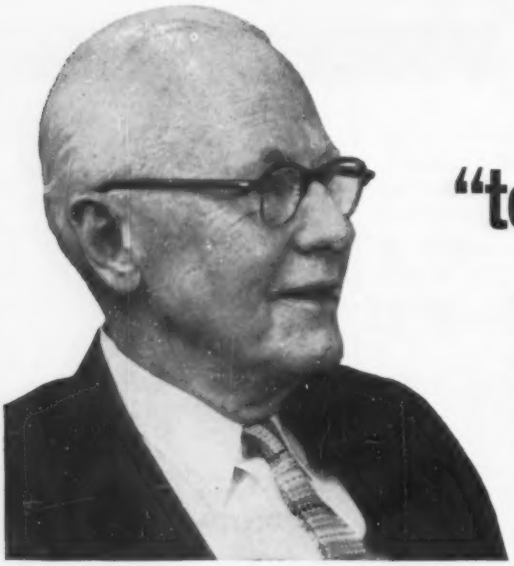
Write for catalogs on:
SPACE MISER
FUTURAMA LINE
MITY-MITE LINE
HANDLING EQUIPMENT
MEDIA AND COMPOUNDS
Service is our most important product . . . Use it!

SPEED-D-BURR CORPORATION
3613-A San Fernando Road, Glendale 4, Calif.

Bucket handles turnings —and other scrap, too!

Here is the husky Class K Hayward you see in so many mills and plants everywhere. You can't beat this powerful bucket for handling turnings, other scrap or almost anything else. Available also with special digging teeth for heavy rock work, cutting clay, handling rubbish. The Hayward Company, 50 Church St., New York 7, N. Y.

HAYWARD BUCKETS
CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888



"to reach industrial buying

For all of the 37 years since he left Officers' Training Camp at the close of World War I, Reed Schreiner has been in steel. Seven years ago he became Director of Advertising for the United States Steel Corporation, a position for which he qualified by serving the Corporation and its various subsidiaries in many capacities from copywriter to Assistant Director of Advertising. We recently visited Mr. Schreiner in his Pittsburgh office to learn something about his philosophy and experience in the use of business publications. Here are the highlights of our long and pleasant talk with this seasoned advertiser.

Q Tell me, Mr. Schreiner, just how many years has your corporation been advertising?

A I'm afraid that's a question that cannot be answered without considerable research. This corporation is the sum total of many different organizations whose advertising histories are obscured by time. I think I can best answer your question by saying that we've been at it for a long, long time.

Q I'm certain that the record reveals many interesting highlights and advertising firsts. Among them, what do you consider to be of particular interest?

A Well, one advertising first that immediately occurs to me is the fact that we were among the very first, possibly the first, to use the cartoon technique in industrial advertising.

Q And that was how long ago?

A Offhand, I'd say about 1930.

Q And how about a highlight from your postwar advertising activities?

A Well, as you perhaps already know, we were the first basic material producer to promote the products of our customers in the consumer market on an industry-wide basis. By that I mean we promote the use of steel, not just U.S. Steel, with the firm belief that we will get our fair share of the steel business created.

Q That is very interesting. Tell me, did you use business publications for this undertaking?

A Yes, we did and still do. And very extensively, I might add.

Q Just what is your philosophy in respect to business publications, Mr. Schreiner?

A We regard them as a vital link in our chain of communications. Properly used, they contribute importantly toward the attainment of our sales objectives. We know of no better way to reach industrial buying influences economically and efficiently.

Q Approximately how many business publications do you use?

A Something more than 300.

Q What percentage of your total budget goes into business publication advertising?

A About 28%. And you will be interested to know that this represents the largest single expenditure in our advertising budget.

Q For what specific purposes do you use business publications?

A I would say that we have two basic reasons. The first, of course, is to reach the many and varied buying influences in which we have an interest. The second is to conserve the time of our salesmen.

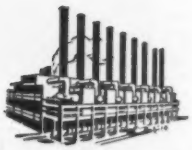
Q With a product and organization such as you have, your salesmen certainly do not have to overcome the more common obstacles, Mr. Schreiner. Just how, then, does business publication advertising help conserve their time?

A In many ways, but I'll illustrate just

one. Not very long ago we developed and introduced a new constructional alloy steel, and we advertised this fact in appropriate business publications. Our salesmen reported that as a result, they generally found the customer familiar with the new product and eager to discuss it. In a word, the advertising had done the spadework for the salesman—had saved him the time it would have taken to introduce this product to an unconditioned prospect.

Q What, in general, do your salespeople have to say about your use of business publications?

A I think their opinion about the value of business publications is best evidenced by the fact that they are constantly after us here in Advertising to do more and more—to add publications, to increase our use of those we are already in.



influences economically and efficiently"

Q What do you think the average reader looks for principally in a business publication?

A For information pertinent to his particular industry, for trade news, for a report on new developments and new products which may directly or indirectly affect him. But more importantly, I think he looks for an accurate, impartial interpretation and analysis of the news and developments within the

industry. It is for this reason that I say business publications have leadership responsibility to their respective industries. Not only do they help the reader do a better job today, but very often they have a definite influence on his personal development and growth within an industry.

Q What general rule or rules do you apply to the preparation of advertisements in business publications?

A We firmly believe in factual information advertising that features the merits of our products without reference to competitive products.

Q Do you feel that advertisements are important to the reader of a business publication?

A Indeed I do. Not so long ago, we asked a group of some 250 busy officials in various industries whether or not they would prefer the business publications they regularly read to carry no advertising. While I am not at all surprised at the outcome, I am surprised by the one-sidedness of the attitude revealed—96% said the elimination of advertising would be highly undesirable.

Q Do you feel that business publications are increasing in importance?

A Definitely. New developments are coming along so fast, and business is becoming so complex, that the need for the many services rendered by business publications is greater than ever before.

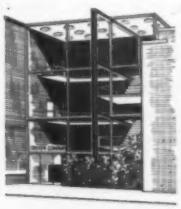
Q What are your criteria for the selection of a business publication?

A In general terms we look for the publications having acceptance within an industry. We naturally consider such important factors as editorial content, circulation, and selling power, but if you find evidence of high reader acceptance you can be certain that all the other considerations are in line.

★ ★ ★

Modern business publications are the all-important link between you and the buying influences you want to reach. They provide the means for reaching your prospects and customers on common ground—at a time when they are receptive to your sales message. In this respect, business publications fill a role unduplicated by any other known selling force.

Chilton publications cover their fields with an editorial excellence and a quality of circulation that assure confidence on the part of readers and advertisers. With such acceptance goes a proportionate selling power. Let Chilton publications help give your advertising maximum effectiveness.



Chilton
COMPANY

Chestnut and 56th Streets • Philadelphia 39, Pennsylvania

CHILTON PUBLICATIONS: Department Store Economist • Hardware Age The Iron Age • Jewelers' Circular–Keystone • Distribution Age • Motor Age Automotive Industries • Optical Journal and Review of Optometry • Spectator Commercial Car Journal • Boot and Shoe Recorder • Hardware World Gas • Electronic Industries • Butane-Propane News • Book Division

RAILWAY EQUIPMENT FOR SALE

Used – As Is – Reconditioned

RAILWAY CARS
All Types

SERVICE-TESTED ®
FREIGHT CAR REPAIR PARTS
For All Types of Cars

LOCOMOTIVES
Diesel, Steam, Gasoline, Diesel-Electric

SPECIAL OFFERING
31 — ALL-STEEL ORE CARS, HOPPER TYPE
40 and 50-ton capacity
Excellent condition. Immediate delivery!

3—AIR DUMP CARS (SIDE DISCHARGE)
Magor—30-Cubic Yard, 50-Ton Capacity, Lift Door Type

RAILWAY TANK CARS and STORAGE TANKS
6,000- 8,000- and 10,000-Gallon Cleaned and Tested

CRANES
Overhead and Locomotive

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-B Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

News of Used and Rebuilt Machinery

Signs of Trouble? . . . While summer business in the Delaware Valley area continues at a good pace, some dealers are frankly worried.

Sales activity is brisk in some lines, largely those not directly connected with metalworking, in others it ranges from fairly good to poor.

Optimism for a fall upswing is tempered with caution, probably more because the used machinery market in the area is slow, rather than downright bad.

Reasons Varied . . . What's the cause of the sluggishness? Apart from the effect of vacations and the hot weather, a lot of reasons are mentioned by the dealers. The steel strike, cutbacks in auto production, less activity in the appliance field, and a fall off in the amount of subcontracting work given out to local machine shops are cited as reasons why they're not buying.

Reports indicate that some machine shops which relied on subcontracting work related to the automotive and appliance industries are being forced to close up shop. They are selling used equipment to the dealers rather than buying it.

Not Too Bleak . . . Increasing use of auction sales to dispose of heavy machinery and late-model tools has been hurting the dealers, too.

There are other factors which indicate the market picture is not too black.

The boom in construction, both publicly and privately financed, is contributing some leveling to the market. One dealer reports that sales of boilers for new schools, hospitals, government buildings, as well as to industrial concerns, has proved well worthwhile in the last few months. Sales in that field are running well above those of last year.

The building boom is even contributing sales dollars for such items as drill presses and hack saws.

Some Moving, Some Not . . . On the other hand, some metalworking equipment is moving, some isn't. Late-model shears and brake shears that were being snapped up a few months ago are finding no takers. One dealer states that new machines ready for immediate delivery are remaining in the warehouse. Another mentions that presses are "soft."

Lathes, milling machines and horizontal and vertical boring mills are among the items described as going well.

Sales of used machinery have been stimulated to some degree by raises in the cost of new machine tools which have cut the price differential between the two.

"After this if you want to talk to me, just holler down to me, I can hear you!"

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
6' x 3/16" Niagara, Initial Type
6' x ⅜" Webb Hal, Initial Type
10' x 10 Ga. Bertsch, Initial Type
12' x ⅜" Cleveland Pyramid Type
16' x ⅜" Niles Pyramid Type

BRAKES—LEAF TYPE
10' x 16 Ga. Dreis & Krump Hand Operated
12' x ⅜" Dreis & Krump
12' x ½" Dreis & Krump, Motor Driven

BRAKES—PRESS TYPE
10' x ¼" Superior Hydraulic, NEW
12' x ¼" Superior Hydraulic, NEW

CRANES—OVERHEAD ELECTRIC TRAVELING
5 ton P&H 29' Span 230 Volt D.C.
5 ton Shepard Niles 45' Span 220/440 A.C.
5 ton Shepard Niles 55' Span 220 Volt D.C.
5 ton Cleveland 96' Span 230 Volt D.C.
10 ton Cyclops 40' Span 220/400 A.C.
10 ton P&H 96' Span 220 Volt D.C.
15 ton P&H 46' Span 230 Volt D.C.
25 ton L-B 75' Span 220/3/60 A.C.
Incl. 300 ft. Runway
120 ton Whiting 80' Span 220/3/60 A.C.

FORGING MACHINES
2" Ajax Air Clutch
1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP
800 & 2000# Chambersburg J-2
1000, 1200, 25.0# Chambersburg
1600# Billings & Spencer

HAMMERS—STEAM DROP
1000, 1250, 3000# Chambersburg

HAMMERS—STEAM FORGING
800, 1100, 1500# Niles-Bement-Pond
1500, 2000, 4000, 8000# Chambersburg
1000, 1100, 1500, 6000, 12,000# Erie
10 Ton Massey—New 1942

LEVELLERS—ROLLER
60" United 17 Rolls 3⅝" Dia.
72" McKay 17 Rolls 4½" Dia.
72" McKay 17 Rolls 2½" Dia. Backed-up
84" McKay 17 Rolls 4⅝" Dia.

No. 3 MEDART THREE ROLL ROTARY STRAIGHTENER
CAPACITY 1" to 4" DIAMETER PIPE OR TUBING

PRESSES—HYDRAULIC
500 ton Clearing H-1500-40, 24" Stroke, Bed 36x42"
600 ton Southwark 16" Stroke, Bed 60x74"
750 ton Elmes, 54" Stroke, Platen 30¼x38"
800 ton Clearing, 48" Stroke, Bed 48x48"
1000 ton Lake Erie Dble Acting, 46" Strokes, Bed Area & Platen 72" x 146"

PRESS—STRAIGHT SIDE
Clearing Model TF41500-200 Triple Acting Strokes 40, 32, 14", Bed Area 100" x 200"

PUNCH & SHEAR COMBINATIONS
Style EF Cleveland 36" Throat, Punch 1¼" thru 1"
Style W Cleveland 60" Throat, 312 Ton
Pels LUSEFF, Punch 1⅝" x 1" Shear Angles 6 x 6 x ¾" Rd. 2⅛", Sq. 2⅝", etc.

ROLLING MILLS
10" x 16" Single Stand, Two High
12" x 16" Phila. Single Stand, Two High
12" x 20" Standard Single Stand, Two High
15" x 28" Farrel Single Stand, Two High
18" x 30" G & M Single Stand, Two High
16" x 24" Farrel Two Stand, Two High
22" x 12" x 40" Lewis 3-High Sheet Mill
44x28" x 44x144" Three High
26" x 54" United Single Stand, Two High

ROLLS FORMING
M-2-10 Yoder & M-2½-12 Yoder Cold Rolled Forming Machines, Complete with Coil Stands, Tables, Cut-Off, Etc.
8 Stand Maplewood, Spindle 2" Dia., 12" Dist. between spindles

SHEARS—GATE
90" x 1¼" Williams & White
125" x 1" Hilles & Jones

SHEAR—ANGLE
6 x 6 x ⅝" Cleveland

SHEARS—SQUARING
10' x ¼" Cincinnati, LATE
12' x 3/16" Niagara SL-12
12' x ⅜" Steelweld LATE
14' x ⅜" Dreis & Krump

SLITTERS
36" Yoder Slitting Line
G-48 Yoder Gang Slitter, 5" Threaded Arbor

STRAIGHTENERS
Kane & Roach 2 Roll Rotary Straightener, M.D. Capacity Mildsteel ⅛" to ⅜"
Kane & Roach 5 Roll #5250-B, Capacity ⅜" to 2½" solid, 4¼" Tube
Aetna Standard 12 Roll Straightener, Capacity 2"

SWAGING MACHINE
#6½A Fenn, Capacity 2½" Tube, 3¾" Solid 10" Die Length. Hydraulic Feed. LATE

TESTING MACHINES
60,000, 100,000, 200,000 Olsen & Riehle Universal 50,000 and 300,000 lb. Compression

A. T. HENRY & COMPANY, INC.
Manufacturing • Equipment
50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged
Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A. C. MOTORS
3 phase—60 cycle
SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1500	G.E.	MT	6900	1187
1	1100	G.E.	IM	2300	720
1	1000	A.C.	Mill	2300	240
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW-900A	440	1170
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1213	2200	435
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-559S	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	20QB	440	505
1	200	G.E.	IM	440	435
1	200	G.E.	IM	2200	580
1	150(unused)	Whse.	CW	2300	435
2	125	A.C.		440	865
1	125	Al. Ch.		440	720
1	100	G.E.	IM-16	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
2	650	G.E.	FT-559BY	440	3570
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IE-15B	2200	1165
1	400	G.E.	IK	2200	500
1	200	G.E.	IK-17	440	580
3	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440900/450	
1	150	Whse.	CS856S	440	880
1	150	Whse.	CS	440	580
2	125	Al. Ch.	ARW	2200	1750

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	2501SL4000/6900/13800		514
1	2850	Whse.	.8 p.f.	2300/4600	514
1	2800	Whse.	.8 p.f.	2300	720
2	2000	Whse.		2300	120
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/12000	600
3	500	G.E.	TS-7567	2200	1200
1	450	Whse.		2200	128.5
1	450	Whse.		2200	450
1	400	G.E.	TS-7565	2200	1200
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

4" National Upsetter High Duty, guided overarm slide, air clutch
Ajax & National Upsetters, suspended slide, 2½", 3", 4"; similar upsetters not suspended slide, ¾", 1", 1½", 2", 3"
5" Acme Upsetting & Forging Machines suspended slide, cam side die slide
700-ton Ajax High Speed Forging Press
50,000# Standard Double Draw Bench
#3 Abramson Bar & Tube Straightener
Pels FV-75 Bar & Billet Shear, Cap. 7½" rd
10' x ½" Plate Shear, Long & Allstatter 10" throat, M.D. Rebuilt
Also 10' x ¾" L & A
Hilles & Jones and Buffalo Shears 1½", 2", 2½", 3", 3¼", 4" and 4¼"
1600 Chambersburg Model F Board Drop Hammers, Roller bearing; double V-ways, Built 1943
1500 lb. Niles Steam Forging Hammer
4000# Niles Bement Double Frame Steam Forge Hammer
Bradley Hammers, various sizes, including 500# Upright
Nazel Air Forging Hammers, #2-B, 4-B, 5-N
Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U-type
Landis Landmaco and other Landis Threading Machines from ⅜ to 4"
Single and Double End Punches
Angle Bender W. W. 4 x 4 x ⅜"
Angle Shear H. & J. 6 x 6 x 1"
No. 3 Motch & Merryweather Saw, with Saw Grinder

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1913 W. 74th Street, Chicago 36, Ill.

SELECT MACHINE TOOLS

GRINDING MACHINES
72" Hanchett 3-spd. rotary surface, new 1946.
13" x 60" Model 300 Hanchett vert. spdl., late.
14" x 36" Pratt & Whitney hyd. vert. surface, 1942.
No. 72A5 Heald hyd. pl. internal, extended bridge, 1943.
No. 74 Heald hyd. pl. internal, X-sliding H. B., 1941.
16" x 36" Landis type C hyd. pl. cylindrical, 1942.
6" x 30" Cincinnati EA Filmatic pl. cylindrical, 1942.

HAMMERS
No. 3 C Chambersburg pneumatic, serial No. 2297.
No. 6-1 Nazel, pneumatic, late.
No. 6B Nazel, self-contained.

LATHES
No. 3 Gisholt Univ. Turret Lathes (2), 1942.
14" x 6' Hendey Toolroom, 1940.
19" 30" Lipe Carbo-Matic, 1942.
36" x 42" Bullard New Era vertical turret lathes.
120" x 90' CC Niles Bement Pond engine lathe, 80 HP, M.D.

PLANERS
36" Rockford Hyd. Openside Shaper-Planer.
42" x 42" x 12' Liberty dbl. housing planer, 35 HP M.D.
48" x 48" x 10' Gray Maxi-Service.

PRESSES
90 ton No. 92½C Toledo D.C. Str. Side.
260 ton No. 795½-72 Toledo D.C., Toggle drawing.
500 ton No. 1039 Hamilton D.C. adj. bed. 90" x 102".
2000 ton No. 6 National Maxipress Forging Pres.

SHAPERS & SLOTTERS
24" Gould & Eberhardt Universal
24" Rockford Hy-Draulic universal.
32" G & E Invincible, F.M.D.
36" Rockford openside hyd. shaper-planer, ser. 338U35.
36" Rockford hyd. vertical slotter, new 1944.

UPSETTERS
1½" National Upsetter, guided ram, hard ways.
2" National Upsetter, guided ram, air clutch.
3½" Ajax suspended slides, steel frame.
4" National high duty, susp. & guided rams.
7½" National Upsetter, air clutch, new 1944.

1000 Tools in Stock

Free Illustrated Catalog

MILES MACHINERY CO.
PHONE SAGINAW 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

No. 1 & No. 2 BUFFALO FORGE Vertical Angle Bending Roll, Motor and Controls.

FALK MACHINERY COMPANY
16 Ward St. Baker 5887 Rochester 5, N. Y.

BENNETT MACHINERY CO.

ENGINE LATHE
50" swing x 42' centers Betts Bridgeford, 2 carriages, 9 speeds, wt. 63,000 lbs.

375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-8996 N. Y. Phone: LOngacre 3-1222

Nos. 5G & C12 Natco Multi-Drills.
3" Gleason Str. Bevel Gear Generators.
K & T No. 3B Plain M.I.B., Vert. Attach.
K & T No. 2B Plain Mill, M.D.

D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—84" & 22" x 112" 3-HIGH PLATE MILL with front and back tilting tables. 1500 HP motor and gear set; also 84" 3-high jump mill.
1—30" x 57" BLOOMING OR SLAB MILL, 2-HIGH reversing.
1—27" x 90" SCALE BREAKER with power screwdown.
1—28" 2-HIGH PINION STAND, modern design.
3—16½" PINION STANDS, for hot strip mill.
1—12" & 22" x 40" 3-HIGH HOT SHEET ROUGHING MILL.
1—18" x 24" COLD MILL, 2 stands, 400 HP gear set.
1—24" BAR MILL, 3-HIGH, 3 stands, with variable speed D.C. motor, traveling tilting tables, roller tables, saws, bloom shear, furnaces.
3—18" BAR MILL STANDS, 3-high.
1—18" ROD MILL, 14 passes.
1—34" x 192" ROLL GRINDER with motors and controls.
2—ROLLER LEVELERS, McKay, rolls 80" face x 5½" dia., with gear box and universal spindles.
1—PICKLING MACHINE for sheets, Taylor design.
1—44" ROLL LATHE, enclosed headstock, tailstock, plano rest, 20 HP, 500/1500 RPM, 230 volts D.C. motor and controls.
1—36" ROLL LATHE, enclosed headstock, 25 HP, 400/1200 RPM D.C. motor.
2—PACK FURNACES for hot sheet mills, 62" x 60", double chamber.
10—AJAX electric induction melting furnaces, 2900 lbs. each.
1—3-TON ELECTROMELT electric melting furnace, good condition.
1—60" MORGAN SAW, horizontal sliding frame.
1—58" GALVANIZING LINE for sheets.
1—MESTA GUILLOTINE SHEAR, 8" stroke, 28" knife, 600 tons pressure.
1—#6 UNITED ALLIGATOR SHEAR, 5" x 5.
1—UNITED #4 vertical open side bar shear.
1—UNITED PLATE SHEAR, capacity 9/16" x 156"
1—SHEET SQUARING SHEAR, Mesta, ⅝" x 156".
3—SHEET POLISHING MACHINES, Mattison, 36" x 120" and 48" x 120".
1—DRAWBENCH, AETNA-STANDARD, 50,000 lb. capacity, 100 HP. A.C.
1—#0 MEDART STRAIGHTENER, 2 rolls, cap. ¼" to 1½" dia. bars.
1—#2 KANE & ROACH STRAIGHTENER for angles, channels, flats, squares, rounds.
1—COKE OVEN PUSHER, used very little, excellent condition.
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1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 353 RPM.
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1	2500	Whse.	720	600	4160-2300
1	2000	Al. Ch.	720	250	4160/2300
1	1200	Whse.	720	600	2300
1	1120	Elliott	720	260/280	2300
1	500	G.E.	1200	250	2300/440
1	500	Ch. Wa.	720	575/600	2300/440
1	300	G.E.	1200	250/275	2300
1	200	Elliott	1200	125	4000/2300
1	150	G.E.	1200	250	2300/440
1	120	Whse.	1200	250	2300/440
1	100	Al. Ch.	1200	250	4000/2300

DIRECT CURRENT MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	3000	Whse.	Mill	525	600
6	1500	Whse.	Mill	525	600
4	700	Whse.	Mill	250	300/700
2	600	Al. Ch.	Mill	600	300/600
2	600	Whse.	Mill	230	110/220
2	500	Whse.	Mill	230	285/710
1	450	Whse.	SK	230	450/600
1	350	G.E.	CD-189	230	1150
1	300	Whse.	Mill	230	300
4	275	Whse.	QM	230	425/850
1	200/250	El. Dy.	Ped. Brg.	230	400/1200
1	200	Whse.	SK-210	230	400/800
1	180	G.E.	MPC	230	400
1	150	Whse.	SK-201	230	300/900
2	125	Whse.	SK-184	230	575/850
1	125	G.E.	MPC	230	400/600
1	100	El. Dy.	30-S	230	450/1350
2	100	El. Dy.	30-S	230	475/950
1	80	Reliance	651-T	230	575/1150
1	60/80	El. Dy.	258	230	525/1150
1	40	G.E.	CD-133	230	500/1000
1	40	Whse.	SK-140	230	500/1700
1	32½	Whse.	SK-150	230	400/1200
2	25	Whse.	SK-92	230	1800
1	20	Cr. Wh.	D.P.B.B.	230	1150/2400
1	20	Whse.	SK-123	230	400/1200
1	15	G.E.	CD-85	230	575/2300
3	15	Whse.	SK-100L	230	500/1500
1	15	Reliance	155-T	230	400/1600
1	10	Whse.	SK-103	230	400/1600
1	10	Al. Ch.	E-122	230	300/1200
4	10	Whse.	SK-91	230	250/1000
1	7½	G.E.	CD-75	230	690/2070
1	7½	G.E.	CD-85	230	450/1350
4	5/7½	Reliance	T.E.F.C.	230	337/1350

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14 x 52" Norton, motorized
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750	*Westg.	CS	900
500	*Al. Ch.	ARW	3600
500	*G.E.	KT5698	900
500	G.E.	KT-424	450
450	*Al. Ch.	ARW	1800
400	G.E.	KT-424	720
300	G.E.	KT-6358 TEFC	720
250	Westg.	CS-TEFC	1800
250	G.E.	KT-550	1800
250	*L.-Allis.	CEX-148	720
250	*G.E.	IK	600
250	G.E.	IK-17A	600
250	Westg.	CS-14	514
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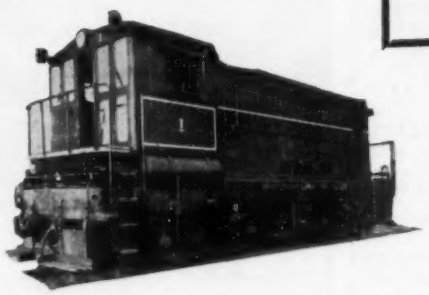

100-ton Baldwin diesel switcher locomotive. 0-4-4-0 single power plant diesel electric locomotive—class 8-OE-660/1-E-1. Standard gauge—40" drivers—truck journals 6"x11". OVERALL DIMENSIONS: height to top of cab—14'3"—maximum width 10'2"—length inside knuckles—39'6". Weight on drivers loaded—205,600 pounds. 4 traction motors. Oil engine—660 H.P.—12½"x15½"—VO-6. Electric generator—Allis Chalmers. Built by Baldwin Locomotive Works. Good operating condition. Out of service for only 1 month.

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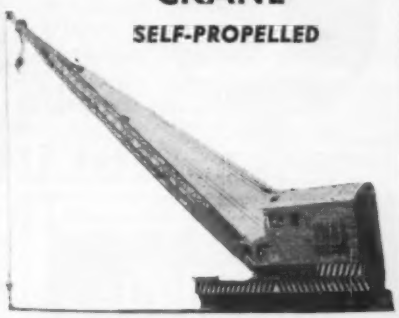

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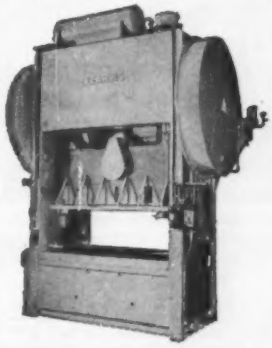

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1 Chesepeake 15 ton 87' 11" span 440 A. C.
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A long-established, successful and progressive company designing and manufacturing heavy machinery is seeking a Director of Purchases.

We want a man in his early thirties and at present employed. A knowledge of the Steel and Heavy Machine Industries would be advantageous but is by no means a necessity.

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MANUFACTURER'S REPRESENTATIVE WANTED—Dayton, Columbus, Cincinnati area. Well established Ohio Cast Bronze Bushing Manufacturer. Please write giving full details. All replies strictly confidential. Address Box G-391, care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

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To sell nationally advertised line of industrial marking devices. Sell to industrial distributors, supply houses. Good territories open. Opportunities permanent and unlimited. Factory backs you up with advertising point-of-sale material and other promotion. In reply, state territory covered, lines handled, types of accounts served. All correspondence kept confidential.
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Southern California concern operating a large variety of heavy machinery and mobile equipment has technical staff position open for qualified man with mechanical or chemical engineering degree, or equivalent. Must be able to prescribe correct lubricants and lubricating methods, write specifications and schedules, oversee lubricating costs and standards in wide range of usage. State experience, age, training, etc.

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THE IRON AGE

METALWORKING BRIEFS

Farm Implement Prices Rise

Higher prices for farm implements are in line following International Harvester's 5 pct increase in list prices for tractors and implements. Other producers are expected to follow suit by Sept. 15 when I-H's new prices go into effect. Higher costs of labor and the new steel price levels are blamed for increased prices.

Unemployment Continues to Drop

Unemployment insurance claims dropped to the lowest level of the year during the week ended Aug. 11. The U. S. Dept. of Labor reported, however, that despite the low for the year, the total of persons filing for initial compensation was still 20,000 over the same period in 1955.

Lower Prices Ahead for Zirconium Products

Firth Sterling, leading producer of zirconium and zirconium alloys, expects that next year it will be in a position to supply mill rolled zirconium products at prices about one-third lower than now published. The company is increasing its zirconium melting capacity, will be capable of producing up to one million tons a year, as sponge becomes available.

Nickel Anodes Decontrolled

Nickel anodes were taken off the list of controlled materials by the Business and Defense Services Administration. BDSA says the action permits defense users of nickel anodes to continue to obtain them from suppliers by the use of defense order ratings.

Look for New Coated Steel Sheets

Cold-rolled sheets coated with vinyl plastic are now in experimental production at U. S. Steel's Irvin Works near Pittsburgh. New product is reported to have the durability for use in refrigerators, auto bodies, furniture and other applications. It can be made in a wide range of colors.

Big Business in Wind

Pittsburgh-Des Moines Steel Co., Neville Island, Pa., has been awarded a $3.6 million contract for major components of a $12 million super-sonic wind tunnel now under construction by PDM for the U. S. Air Force at Arnold Engineering and Development Center, in Tennessee.

Money Gets Tighter

Sales finance companies have boosted their commercial paper rate by ¼ pct. Increases are said to be in line with last week's jump in the Treasury rate bill, which jumped again this week.

ADVERTISERS

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

A

Ajax Electric Co., Inc. 4
Ajax Electric Furnace Corp. 4
Ajax Electro Metallurgical Corp...
Ajax Electrothermic Corp. .....
Ajax Engineering Corp. 4
*Allegheny Ludlum Steel Corp... 116
Allied Research Products Inc. Between Pages 20 & 21
Allis-Chalmers Mfg. Co. 166
Alloy Industries 162
American Pulverizer Co. 122
Armel, James P. 160
*Armstrong-Blum Manufacturing Co. 80
*Armstrong Bros. Tool Co. 155

B

Babcock & Wilcox Co., The, Refractories Div...Inside Back Cover
*Babcock & Wilcox Co., The, Tubular Products Div. 12
Barium Steel Corp. 51
*Barksdale Valves 165
Belyea Co., Inc. 159
*Benchmaster Manufacturing Co. 78
Bennett Machinery Co. 159
Bethlehem Steel Co. 1
Birdsboro Steel Fdry. & Machine Co. .....34 & 35
Blaw-Knox Company, Foundry & Mill Machinery Division....40 & 41
Boleg, S. A. 162
Boston Metals Co., The.....161 & 162
Browning, Victor R. & Co., Inc... 155
Bucyrus-Erie Co. 115

C

*Carlson, G. O., Inc. 136
Chicago Electric Co. 160
*Chisholm-Moore Hoist Div. 125
*Cincinnati Milling Machine Co., The, Process Machinery Division 76
*Cincinnati Shaper Co., The ...92 & 93
Cities Service Oil Co. 82
Clark Controller Co., The 48
Clearing Machine Corp. Div., U. S. Industries Inc. 119
*Cleveland Crane & Engineering Co., The Steelweld Machinery Div. 46
Colorado Fuel & Iron Corp., The, Wickwire Spencer Steel Div.... 113
Columbia-Geneva Steel Div., United States Steel Corp. 28 & 29,127
Consolidated Machine Tool Co. Division of Farrel-Birmingham Co., Inc. .....32 & 33
Continental Foundry & Machine Division Blaw-Knox Co. .....40 & 41
Crawford, F. H. & Co., Inc. 160
*Cromwell Paper Co. 68
Crucible Steel Co. of America.. 10

D

Dawlen Corp. 161
Donahue Steel Products Co., Inc. 159
Dony, D. E. Machinery Co. 159

E

Eastern Machine Screw Corp., The 155
Eastern Machinery Co., The 160
Electric Controller & Manufacturing Company, Division Square D Company 145
*Electro Metallurgical Co., a Div. of Union Carbide & Carbon Corp. 16
Elstein, M. 162
Erie Forge & Steel Corporation .. 20
Erie Strayer Co. 114
Espen-Lucas Machine Works, The 155
Eveready 161

F

Fabrikant Steel Products, Inc.... 161
Falk Mill Supply Co., Inc. 159
*Farval Corporation, The 54
Federal Products Corp. 47
*Fenn Manufacturing Co., The 13
Fenway Machine Sales Company, Inc. 86
*Fischer Special Mfg. Co. 123
Foster, Frank B., Inc. 160
Frank, M. K. 161

G

*Gallmeyer & Livingston, Inc.... 134
*Gardner Machine Co. 21
*General Electric Co., Apparatus Dept. 43
Gisholt Machine Co. .....26 & 27
*Globe Steel Abrasive Co. 90
Goodman Electric Machinery Co. 161
Goss & DeLeeuw Machine Co. ... 155
Greenpoint Iron & Pipe Co., Inc. 162
Griffin Manufacturing Co. 155

H

Hayward Company, The 155
Hendrick Manufacturing Co. 112
Henry, A. T. & Company, Inc. ... 159
Hilyard Co., The..... 162
*Homestead Valve Manufacturing Company 19
Houghton, E. F. & Co. 111
Hughes, Arnold Co. 162, 163
Hyman, Joseph & Sons 161

I

Illinois Clay Products Co. 45
Ingersoll Kalamazoo Div., Borg-Warner Corporation 141
Iron & Steel Products, Inc. 158

J

Jones & Lamson Machine Co...38 & 39
Jones & Laughlin Steel Corp. 84

IN THIS ISSUE

K

*Kaiser Aluminum & Chemical Sales Inc., Kaiser Chemicals Division 42
Kasle Steel Corp. 162
Kickham Boiler & Sheet Iron Works 163
Kinderman, Lou F. 160

L

*L & J Press Corp. 135
*Laminated Shim Co., Inc., Stampings Div. 126
Landis Tool Co. .....14 & 15
Lang Machinery Co. 160
*Lees-Bradner Co., The 74
Lindberg Engineering Co. 50
Luria Bros. & Co., Inc. 143

M

McLouth Steel Corp. Between Pages 20 & 21
McNally-Pittsburgh Mfg. Corp... 162
MacCabe, T. B. Co. 160
Mackintosh-Hemphill Division E. W. Bliss Company 49
Mahon, R. C. Co., The 129
Martin, Joe, Co., Inc. 162
Meriwether, Geo. M. 162
Mesta Machine Co. 94
Metal Processing Machine Co. Division McKay Machine Co. ... 91
Metal & Thermit Corp. 73
Miles Machinery Co. 159
Morrison Railway Supply Co. 162
Motch & Merryweather Machinery Co., The 8

N

National Acme Co., The 121
*National Automatic Tool Co. 88 & 89
National Business Bourse, Inc.....163
National Machinery Exchange ... 161
National Steel Corp. 71
National Tube Div., United States Steel Corp. .....28 & 29
New Departure Div., General Motors Corp. 52
*Niagara Machine & Tool Works 22 & 23

O

*Ohio Crankshaft Co., The 131
Ohio Ferro-Alloys Corp. 5
Ornitz Equipment Corp. 161

P

Phosphor Bronze Corporation, The 11
Platt Bros. & Co., The 155
Purdy Company, The 162

R

Rail & Industrial Equip. Co., Inc. 162
*Republic Steel Corp. .....36 & 37
Roebling's, John A. Sons Corp.... 17
*Roots-Connersville Blower Division Dresser Industries, Inc. 124
Ruthman Machinery Co., The 120

S

*Sciaky Bros., Inc. Between Pages 16 & 17
Seymour Manufacturing Co., The.. 11
Sharon Steel Corp. 6
*Speed-D-Burr Corporation 155
*Square D Company, E C & M Division 145
Standard Pressed Steel Co. 153
Stanhope, R. C., Inc. 161
Steelweld Div., The Cleveland Crane & Engineering Co. 46

T

Tennessee Coal & Iron Div., United States Steel Corp. 127
*Thomas Flexible Coupling Co.... 133
Thomson Electric Welder Company 30 & 31
Timken Roller Bearing Co., The.. 87
*Torrington Co., The Needle Bearing Div. 18

U

Union Carbide & Carbon Corp. Electro Metallurgical Co. 16
United Chromium Division, Metal & Thermit Corp. 73
United States Steel Corp. 28 & 29, 127
United States Steel Export Co. 28 & 29, 127
United States Steel Supply Div., United States Steel Corp. 127

V

Verson Allsteel Press Co. Back Cover

W

*Wagner Electric Corp. 44
Wallack Bros. 163
Ward Steel Co. 9
Warner & Swasey Co. 65
*Webb Corp., The, Reed Equipment Division 132
Weirton Steel Co. 71
Weiss Steel Co., Inc. 163
Westinghouse Electric Corp...24 & 25
*Whiting Corporation Inside Front Cover
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp.... 113
Wilson, Lee, Engineering Co., Inc. 67

CLASSIFIED SECTION

Clearing House 158-162
Contract Manufacturing Appears in first and third issue of each month. See Aug. 2 & Aug. 16
Employment Exchange 163
Equipment & Materials Wanted.. 163

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Table of Products and Uses

Page

Castables

B&W Kaocrete-32 — Special High Temperature Service—To 3200 F — 7

B&W Kaocast — High Temperature, General Purpose Use—To 3000 F — 8-9

B&W Kaocrete-A — General Purpose Use—To 2700 F — 10-11

B&W Kaocrete-B — For Ease of Plastering in General Purpose Use—To 2300 F — 10-11

B&W Kaocrete-D — For Extra Strength and Abrasion Resistance—To 2500 F — 10-11

Page

B&W Kromocast — Chrome-base Castable for Resistance to Attack of Slag and Other Reactive Products—To 3100 F — 12

B&W Hydrochrome — Chrome-base Castable for Resistance to Attack of Slag and Other Reactive Products—To 2800 F — 12

Insulating Concrete-Mixes

B&W Kaolite-20 · Kaolite-20-Gun
B&W Kaolite-22 · Kaolite-22-Gun

For Castable Convenience Plus Insulating Effect — 13

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